

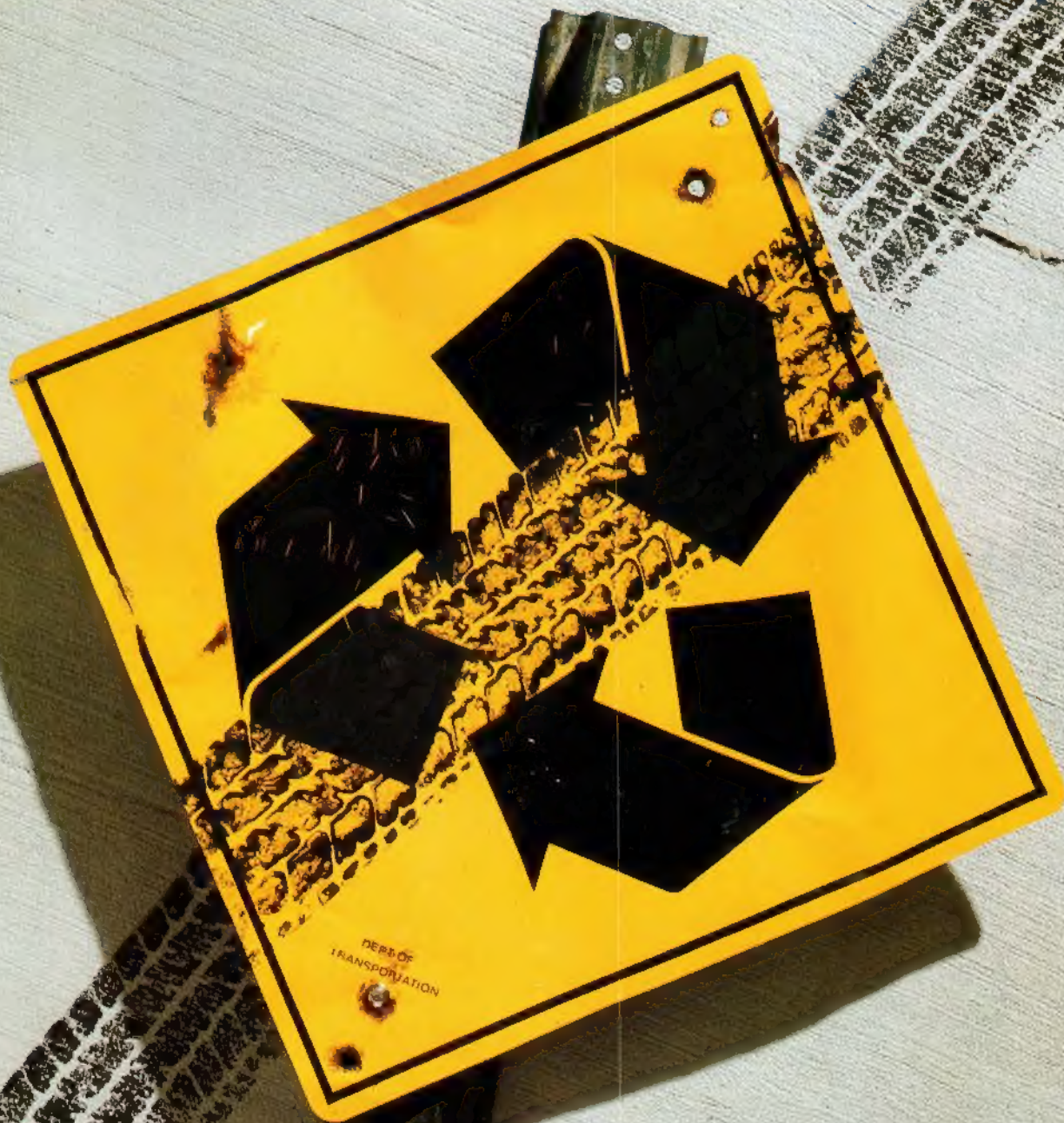
IN  
THIS ISSUE:  
POPULATION:  
Realities for a Finite Planet

THE BUMPY ROAD TO TIRE RECYCLING

MAY/JUNE 1991 \$3.95  
CANADA \$4.95

# GARBAGE

THE PRACTICAL JOURNAL FOR THE ENVIRONMENT



DEPT OF  
TRANSPORTATION





A high-contrast, black and white photograph of a person's legs and arms as they muddle through a dry, cracked desert floor. The person is wearing a dark t-shirt and light-colored shorts. Their right leg is bent, and their right foot is stuck in a deep, dark mud puddle. Their left leg is also bent, and their left foot is also in a mud puddle. The ground is composed of large, irregular, light-colored rock slabs with deep, dark cracks. The person's arms are visible, with their hands resting on the ground. The lighting is harsh, creating strong shadows and highlights.

For a free color catalog, the location of your nearest Patagonia dealer or Great Pacific Iron Works store, or for information on our complete line of technical clothing, layering systems and sportswear, write  
Patagonia Mail Order,  
P.O. Box 8900, Dept. V711,  
Bozeman, MT 59715.  
Or call 1-800-336-9090.

**patagonia®**

*Patagonia donates at least 10% of its pre-tax profits to preserving and restoring the natural environment.*  
Mudding in Pariah Canyon. Photo: ROWAN BAILLIE. © Patagonia, Inc. 1991





## **For more than a quarter of a century we've been stopping communities from burying their past.**

Since 1964, Wellman, Inc. has been recycling plastics and working to keep landfills empty. And every community that's helped out in the recycling effort by sending us their used plastics has gotten something in return.

Cash.

As the largest recycler of plastic containers in the country, we're always looking to buy plastic soda, milk

and water bottles. And today, our appetite is only getting bigger. In 1989 alone, we recycled over 1 billion plastic soda bottles. An incredible figure when you consider only 1.5 billion soda bottles were recycled nationwide.

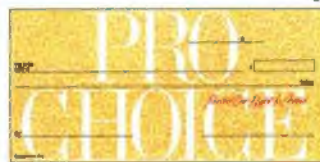
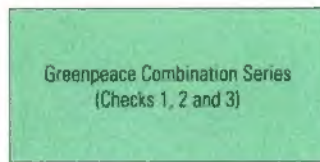
Call us at 1-800-542-7780. We can help set up a recycling program in your community. This way, our landfills can stay empty. And your treasury can stay full.



**WELLMAN, INC.**

1040 Broad Street, Suite 302, Shrewsbury, NJ 07702

# Announcing the end of the *silent* check.



**"It's working! Thousands of you are now using Greenpeace checks. Use these checks, and help us spread our message."**

Peter Bahouth,  
Executive Director, Greenpeace

**"Here's another way to give animals a voice... Message!Checks. You'll increase awareness of our critical work and help us fund our programs."**

Alex Pacheco  
PETA Chairperson

**"Order today and send the message that you will not settle for less than full equality and the right to choose."**

Molly Yard  
President, NOW

## A special offer.

Now you can speak out with every check you write. For clean oceans. Protection of natural habitats. Freedom of choice. For an end to animal testing. You can show those with whom you do business that you are working for a better world. By using Message!Checks.®

## The startling facts.

If you're like the average consumer, you wrote about 300 checks last year. And every last one of them was silent. Now, your check can make a bold statement in support of Greenpeace, Audubon, NOW or

PETA. Your Message!Checks will start discussions. Tell others where you stand. And help educate the public about the important work of these organizations.

## Do they work?

Absolutely. Hundreds of thousands of people are using Message!Checks. They carry the same banking information as your present checks. In fact, the only difference between these checks and the checks you're using now is the message. Message!Checks are endorsed by the leading national socially-conscious organizations.

## The group makes a buck.

Every time you order a supply of Message!Checks, the endorsing group makes a minimum of \$1.00. This translates into thousands of dollars on an annual basis for the continuation of critical work.

## So get the word out.

Don't write another silent check. Not when you could be showing your support for Greenpeace. PETA. Audubon. Or NOW. Order today!

**Satisfaction guaranteed or a full refund will be provided.**

## To order, complete and return this form:

### Greenpeace

- ☐ 1. Greenpeace logo
- ☐ 2. Let the Oceans Live
- ☐ 3. You Can't Sink a Rainbow
- ☐ 3a. Combination series of above

### People For the Ethical Treatment of Animals

- ☐ 4. Stop Animal Testing

### National Audubon Society

- ☐ 5. Protecting Habitats

### National Organization For Women

- ☐ 6. Equality For Women
- ☐ 7. Protect Our Right to Choose

1. Select an organization and a check design from list at left.

2. Select a check style:

- |   |  |
|---|--|
| <input type="checkbox"/> SINGLE \$14.00 per 200 checks                                      | <input type="checkbox"/> DUPLICATE \$14.95 per 150 checks (carbonless copy)                    |
| <input type="checkbox"/> SINGLE Combination series \$16.00 per 200 checks (Greenpeace only) | <input type="checkbox"/> DUPLICATE Combination Series \$16.95 per 150 checks (Greenpeace only) |

3. Indicate shipping preference:

- |   |   |
|---|---|
| <input type="checkbox"/> FIRST CLASS Add \$3.00 (Allow 2 weeks) | <input type="checkbox"/> BULK MAIL No additional charge (Allow 4 weeks) |
|---|---|

4. Attach all 3 of the following to this form:

- Re-order form from present check supply OR voided check with a starting number indicated for your new order.
- Deposit ticket from the same account.
- Payment check payable to Message!Check Corporation.

5. Daytime phone where you can be reached: ( )

6. Mail to: **Message!Check® Corp., 911 East Pike, P.O. Box 3206-GB, Seattle, WA 98114**



# CONTENTS

Vol. III No. 3

May/June 1991

## FEATURES

### THE BUMPY ROAD TO TIRE RECYCLING IN AMERICA

BY AMY MARTIN

From retreads to roadbeds,  
retired tires are finding new uses.

28

### DUMP PICKING FOR BEGINNERS

BY HANNAH HOLMES

Somewhere there's a dumpster with your name on it.  
Dive in!

38

### POPULATION

BY STEPHANIE MILLS

Red-hot realities for a finite planet.

46

### DRIP IRRIGATION

BY ROBERT KOURIK

Sayonara, sprinklers —  
we've got a better way to water the garden.

52

### WHO OWNS EXXON? WE DO.

BY ART KLEINER

Pension funds have made stockholders out of most of us.  
But can we get into the boardroom?

56

## DEPARTMENTS

6 ... FROM THE EDITOR	GARBAGE INDEX ... 63
8 ... LETTERS	KEEPERS... 64
16 ... LIFTING THE LID	READER SERVICE ... 72
24 ... ASK GARBAGE	CLASSIFIEDS ... 76
44 ... REDUCE, REUSE, RECYCLE	IN THE DUMPSTER ... 80
RESTORATION ... 82	



# TAKE A LITTLE PRESSURE OFF OUR LANDFILLS

Use Cross Pointe recycled papers.

You'll lighten the load on our landfills. And you'll open a new world of choices for yourself. Because we make recycled paper in virtually every weight, texture and color. For practically any printing purpose. So you don't have to give up printability, aesthetics or cost effectiveness to be ecologically responsible. Not when over 300 fine paper merchants offer you the most comprehensive line of alkaline, de-inked, recycled papers in the U.S. and Canada: Bellbrook Laid • Cross Pointe Book • Cross Pointe Recycled Bond • Genesis • Halopaque • Heritage Book • Medallion • Miami Book • Normandie • Passport • Sycamore • Torchglow Opaque • Troy Book • (Of course, we make a wide range of virgin fiber papers, too.)

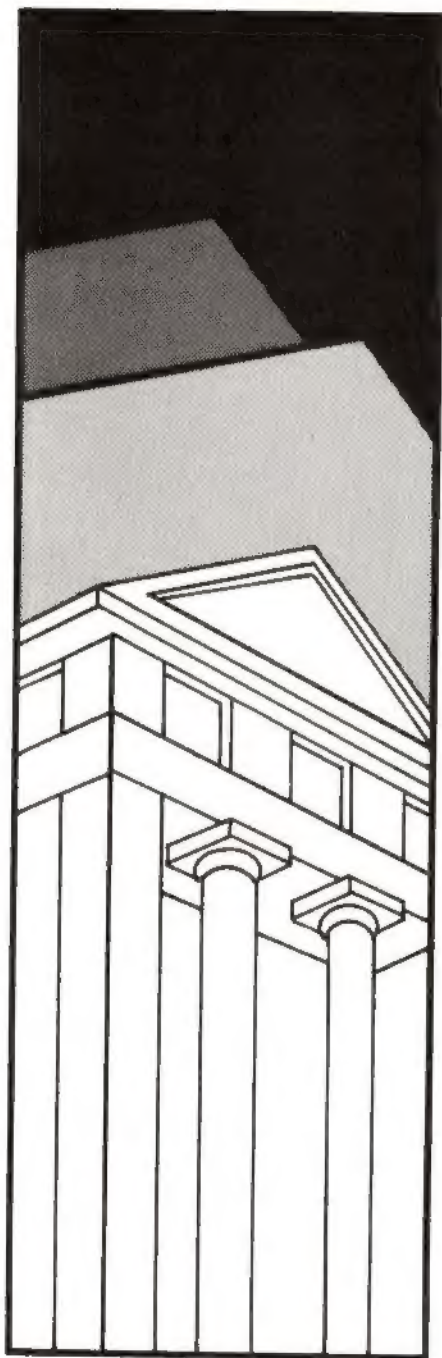


**Cross Pointe**  
PAPER CORPORATION



# Who Says Environmental Protection Makes Economic Sense?

## The Parnassus Fund Does!



Parnassus is a mutual fund that invests in companies that are sensitive to the environment. We also invest in companies that practice corporate social responsibility -- firms that, for example, treat their employees well, have good affirmative action policies and are creative and generous with their charitable contributions. At the same time, we avoid investing in companies that manufacture weapons, produce alcohol or tobacco, are involved with nuclear power or have operations in South Africa.

If you're interested in learning more about the Parnassus Fund, call us at (800)999-3505. We'll send you back a free prospectus and other information about the Fund.

### THE PARNASSUS FUND

244 CALIFORNIA STREET  
SAN FRANCISCO CALIFORNIA 94111

- ☐ Please send me a free prospectus containing more complete information on the Parnassus Fund including sales charges, management fees and expenses. I will read it carefully before I invest or send money.
- ☐ Please send IRA information.

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Daytime Phone: \_\_\_\_\_

**Call (800) 999-3505**

Distributed by Parnassus Financial Management

GAR-5





## Lots of Zeros

**T**his month I considered the advantages of buying a building. But what would the right building cost? "I dunno, but it'll have a lot of zeros," my partner warned....

Writer Amy Martin went out to get the scoop on tires, and found the scrapped backlog was "three billion-with-a-b." Lots of zeros....

Stephanie Mills outlined the realities of overpopulation as an environmental issue. "In 1830, one billion people inhabited the Earth ... in 1960, it hit three billion; 15 years later, four billion; and by 1986 — only eleven years later — five billion...." Really a lot of zeros.

Everything, it seems, was too big for me this month. (Except my clothes ... the baby's seven months old but my clothes are still too small.) Like everyone else, I am overwhelmed by the scope and complexity of environmental problems. Individual action will take us only so far; political change has to follow.

I promised **GARBAGE** would not be a political magazine, and I meant it; we won't tell you how to vote. But some political decisions make assumptions about popular attitudes. For example, a chill has come over discussions of population policies, because eventually you run up against the A word, which is no longer an acceptable topic of conversation, thanks to a dedicated minority of anti-abortion activists who are extraordinarily successful at doing what their consciences tell them they must.

Then there's the new national energy plan. Its call to open up the Arctic Refuge and new offshore sites for oil exploration is at least debatable. What's beyond my comprehension is the lack of incentive for conservation or renewable-energy research. The plan calls for more oil production, more nuclear plants, but doesn't so much as ask for a tighter efficiency standard for cars. While polls indicate that over 70% of Americans consider themselves environmentalists, the energy plan suggests that there has been no shift

whatsoever in our collective attitudes. "Keep it cheap, waste it because there's always a way to make more."

Some sort of shift, on the other hand, was chronicled in *Time*. The magazine's April 8 cover headlines "The Simple Life," and tells us that "Americans, tired of trendiness and materialism, are rediscovering the joys of home life, basic values, and things that last." My interest was piqued ("oh my gosh," I thought, "are we ready to admit that people are sick of being sold things they don't need and lifestyles they don't want?"). The article was about a few hyperachievers who quit their jobs to stay home with the kids. (Of course, one had a \$50 million nest egg, and another bought the local grocery store on an impulse. Just normal folks.)

If I didn't know better, the *Time* article might have convinced me that this is a narrow, bi-coastal baby-boomer trend. (Economist John Kenneth Galbraith, who apparently thinks this simple-life thing is merely a fad, is quoted as saying, "I just think it's pure horseshit.") Yet the article uncovered some things in spite of itself. Like a growing attachment to diaper service (instead of disposables) — indicating, perhaps, a desire to do the right thing; an affection for family time; a preference for safe, reliable cars.

If it is a fad, it's already a long time in coming: *CoEvolution Quarterly* (now called *Whole Earth Review*), whose articles always anticipate the mass media by a decade or two, devoted several issues to what they called "voluntary simplicity" 15 years ago. I think — or maybe I hope — that there's something here with more staying power, a change in attitude that will say no to ruining pristine wilderness for a longshot at finding oil that, at any rate, is guaranteed to run out. An attitude that says we'll drill if we have to, but let's look first at using less oil, not promoting the use of more.

*Patricia Poore*  
Editor

COMING IN JULY/AUGUST  
**GARBAGE**

**Good Woods**

**Garbage Visionaries**

**What's Up, Dow?**



Editor and Publisher  
PATRICIA POORE

Senior Editor  
BILL BREEN

Contributing Editors  
HANNAH HOLMES  
Kennebunk, Maine

ROBERT KOURIK  
Occidental, California

Assistant Editor  
BRIAN JACOBMEYER

Associate Art Director  
JOHN TOMANIO

Production Editor  
COLE GAGNE

Researcher  
STEVEN H. COREY

Technical Consultant  
DR. ALBERT DITTMAN  
Bouse, Arizona

Business Manager  
JULIE E. STOCKER

Circulation Director  
ROSALIE E. BRUNO

Customer Service  
JACK KASKEY

Editorial Director  
SUZANNE LA ROSA

Design Consultant  
ROBERT J. GEORGE

Associate Publisher  
WILLIAM J. O'DONNELL

National Sales Manager  
BECKY BERNIE

Advertising Production Manager  
ELLEN M. HIGGINS

Advertising Associate  
JIM LABELLE

Production Assistant  
JOANNE ORLANDO

Sales Assistant  
ANNEMARIE WHILTON

**GARBAGE** The Practical Journal  
for the Environment

ISSN 1044 3061

Published bi-monthly for \$21 per year by  
Old House Journal Corp., 435 Ninth St.,  
Brooklyn, NY 11215. Telephone (718) 788-  
1700. Subscriptions in Canada are \$29  
per year, payable in U.S. funds.  
Advertising: (800) 356-9313  
Newsstand Sales: (508) 283-4721

Second-class postage paid at Brooklyn,  
New York, and additional mailing offices.  
POSTMASTER: Send address changes to  
**GARBAGE** The Practical Journal for the  
Environment, P.O. Box 56519, Boulder, CO  
80322-6519.

© 1991 by Old House Journal Corp.  
All rights reserved.

printed on Cross Pointe Tray Book,  
50-70% recycled paper at  
The Lane Press  
South Burlington, Vermont



# WATER CONSERVATION

...It's the right thing to do  
...It saves money  
...And it's easy, economical  
and simple

with

## FLUSH-N-SAVE™

A Patented System

a proven and practical  
water saving product you  
can install in about 30 seconds

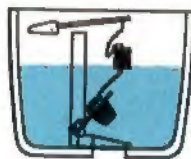


- Over 100,000 units already installed in homes, apartment buildings, condominiums and commercial buildings
- Saves the average household as much as 22,000 gallons a year
- Pays for itself very quickly and continues to save on water bills month after month

**HOW IT WORKS.** Flush-N-Save™ makes use of the pressure from a full tank of water but uses only enough of that water to flush the bowl. With Flush-N-Save™ (see diagram) the flapper valve is fully opened when you depress the trip lever handle. After about 1½ gallons is released under full pressure, the unique adjustable float system closes the flapper valve to end the flush. So with Flush-N-Save™ you always have the head pressure from a full tank of water, but you never use the complete tank as you do without Flush-N-Save™.

WITH  
FLUSH-N-SAVE™

WITHOUT



Saves up to 4 gallons per flush

### ORDER FORM or order toll free 1-800-825-2522

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: (\_\_\_\_) \_\_\_\_\_

another innovation from:



1-800-825-2522  
CONSERVATION  
CONCEPTS

Fax 714-920-0182  
932 W. 9th Street  
Upland, CA 91786

☐ 1 Flush-N-Save™ Installation Kit \$9.95

☐ Quantity \_\_\_\_\_ x \$9.95 = \_\_\_\_\_

CA res. add 6.5% Sales Tax \_\_\_\_\_

Shipping & Handling (\$4.00 ea.) \_\_\_\_\_

TOTAL ENCLOSED \$ \_\_\_\_\_

Please send check or money order (sorry, no C.O.D.'s)

Charge to my:

☐ VISA ☐ MasterCard Expires  MO.  YR.

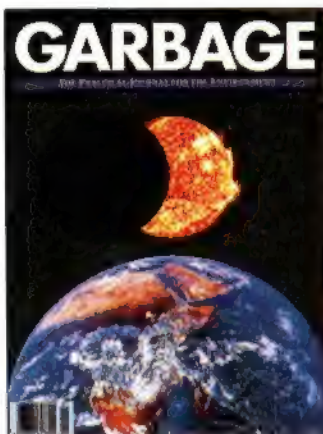
CREDIT CARD NO. \_\_\_\_\_

Contact us for quantity pricing above 100 units.





## Fish-Farm Follies ... To Tree Or Not To Tree ... GARBAGE Gets Her Goat ... The Truck Stops Here ... Antifreeze Addendum ...



Sunny Side Up

### TILAPIA TROUBLE

Although John Reid's fish farming ["New Wave Fish Farmer" Jan/Feb] has a lot of merit, there are also some serious concerns about raising tilapia.

Tilapia were introduced in Florida in the 1960s for biological controls. It was mistakenly rumored at the time that they were also great game fish and they were "accidentally" released into ponds and lakes. Because of the Tilapia's rapid reproduction and tasty flavor, commercial and backyard fish farms flourished in south Florida. As individuals and companies went out of the fish-farming business, their remaining stock of fish was often dumped into nearby canals and ponds. The result today is that tilapia (and other exotic fish imported for fish farming) have seriously threatened, and in some cases replaced, native fish in Florida, especially throughout the Everglades.

Strict regulations need to be enforced to prevent a similar situation from occurring in other states.

Shirley Beccue  
Bar Harbor, Me.

With all of the expertise on your editorial staff, one would think that one of you would have even some minor knowledge about how detrimental raising animals (and yes, fish are animals) for food is to our environment.

I hope this was just a one-time error in judgment by your editorial staff. True environmentalists don't just

want a cleaner environment — they want one where there is greater compassion for all living creatures. John Reid of Bioshelters appears not to care about the environment (or the fish) as much as he does about making a quick buck.

I will still recycle this issue of your magazine to the local library, but without this insensitive article.

B. Baxter  
address unknown

*Thank you for explaining what true environmentalists want. Our errors in judgment wouldn't do too much damage, would they, if there were more people like you who took on the task of cutting out the objectionable parts of the magazine before the public library got hold of it.*

— P. Poore

### SEEDS OF DISCONTENT

While I hesitate to voice a complaint about any article that advocates tree planting on some level and which otherwise was pretty darn good, I must say that Robert Kourik's "Burying the Myths of Tree Planting" [Jan/Feb] had some statements in its opening paragraphs that left a bitter taste in my mouth.

Kourik writes (regarding trees and global warming): "As a metaphor for affirmative action, planting a tree works. As a practical measure for cutting greenhouse gases, it's negligible."

Wow.

OK, sure — taken literally, the planting of one single tree may have "negligible"

results on greenhouse gases (if we are to consider the 13-20 pounds of CO<sub>2</sub> a year that a tree will take in as "negligible") — but, obviously, it's the cumulative total of gases that millions of trees will "breathe in" that is the benefit everyone's talking about. And the only way we are going to reach those millions is if we start planting now — even if it "only" means one single tree at a time.

Jim Hardie  
Santa Monica, Calif.

Your article on the myths of tree planting skirted a troublesome issue. Enthusiastic tree planting can do great harm to an ecosystem, particularly to a "plant community." Those hills behind Mr. Seubert (photo, pages 42-43) appear to be barren, but they support the last vestiges of the plant communities that, before European contact, dominated the northern San Francisco peninsula; to plant trees there would upset the balance of an already pressured system in which several rare species are barely hanging on.

Those who would plant should conduct research or contact local native-plant societies so their efforts can go toward restoring and sustaining ecosystems, rather than further damaging them.

Greg Corning  
San Francisco, Calif.

### KEEP ON TRUCKIN'

The article "Truckin' Trash" was a story that needed to be told. How-



## ENQUIRING EXAMINER

*Back-to-the-land  
— with a vengeance!*

# Rural terror: Utah farmer attacked by compost

by EDDIE PICA

Crapshoot, Utah — Farmer Dusty Stetson was killed early yesterday in a freak fertilizer accident when an out-of-control pile of compost (apparently located on a hazardous waste burial site) engulfed the hapless hayseed and turned him into rich, loamy soil in a matter of seconds. "Should've followed the instructions in GARBAGE," said a

## Sunbelt Sunday Supplement

## Letters to the Editor

Dear Editor: One of my grandsons back east sent me a gift subscription to a publication called GARBAGE. Naturally, I was expecting a magazine chock full of eastern media establishment liberal propaganda. Imagine my surprise, then, to find that GARBAGE is, in fact, as American as apple pie, the Fourth of July, and my coveted copy of Pat Boone's Greatest Hits. All right-thinking people should subscribe to it.

## NEW YORK PEST

*New Brooklyn mag sez:*

# Read it and Sweep!

special to the Pest

A Brooklyn-based magazine is making an all-out effort to gain new readers, and the first step, sources say, is the use of phony newspaper clippings to fool unwary readers. "It could be construed as misleading," said one publishing exec. "Except they're making it extremely obvious. In fact, it's

# GET GARBAGE

THE PRACTICAL JOURNAL FOR THE ENVIRONMENT

☐ Yes. Please start or renew my subscription to **GARBAGE** at the term indicated below:

- ☐ One Year \$21.
- ☐ Two Years \$37 (save \$5).
- ☐ Three Years \$49 (save \$14).

- ☐ New
- ☐ Renewal
- ☐ Payment enclosed
- ☐ Bill me

Name (please print) \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Please allow 4-6 weeks for delivery of first issue  
**GARBAGE** is published 6 times per year

Canadian orders add \$8 per year. U.S. funds only.

4CAS5

# GET GARBAGE

THE PRACTICAL JOURNAL FOR THE ENVIRONMENT

☐ Yes. Please start or renew my subscription to **GARBAGE** at the term indicated below:

- ☐ One Year \$21.
- ☐ Two Years \$37 (save \$5).
- ☐ Three Years \$49 (save \$14).

- ☐ New
- ☐ Renewal
- ☐ Payment enclosed
- ☐ Bill me

Name (please print) \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Please allow 4-6 weeks for delivery of first issue  
**GARBAGE** is published 6 times per year

Canadian orders add \$8 per year. U.S. funds only.

4CBS4

# GIVE GARBAGE

THE PRACTICAL JOURNAL FOR THE ENVIRONMENT

☐ Please send the following gift subscriptions:

First Gift to \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Second Gift to \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

**First gift \$21  
Additional gifts  
only \$16!**

- ☐ Start or extend my own subscription
- ☐ Payment enclosed
- ☐ Bill me

Canadian orders add \$8 per year. U.S. funds only.

From (please print) \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

2CAS7





**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 1188, BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

**GARBAGE**

P.O. Box 51647

Boulder, CO 80321-1647



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 1188, BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

**GARBAGE**

P.O. Box 51647

Boulder, CO 80321-1647



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 1188, BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

**GARBAGE**

P.O. Box 51647

Boulder, CO 80321-1647



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



WE'RE JUST A  
PHONE  
CALL  
AWAY



DIAL  
1-800-888-9070  
TO SUBSCRIBE



## Jeepers Creepers!!



Shouldn't everyone be carrying

**TREEKEEPERS?**

The best alternative to disposables.

(619) 481-6403 (PDT)

We specialize in wholesales and custom imprinting.  
Mail order catalog available



## WAR ON WASTE

Can America Win Its Battle With Garbage?

by Louis Blumberg & Robert Gottlieb

This book examines the fundamental causes of our solid-waste crisis and provides real help to public officials, community organizations, and concerned citizens faced with finding solutions to this problem.

325 pages  
\$19.95 (paper)  
\$34.95 (cloth)

## PLASTICS America's Packaging Dilemma

by Nancy Wolf & Ellen Feldman

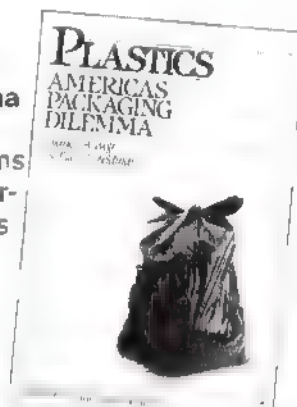
The only book that explains the problems behind disposal of plastic wastes, and the current controversies over such issues as "degradability" and "recyclability."

128 pages  
\$12.95 (paper)  
\$19.95 (cloth)

**ISLAND PRESS**

1-800-828-1302

Call toll-free  
Box 7, Dept. 4HI Covelo, CA 95428  
Please include \$3.00 for shipping and handling



# Office Recycling From Desk to Dock.



Each office, each complex, each organization has different recycling needs. The number of materials, type of business, and type of materials all make a difference.

Having the right combination of collection and transport methods assures your business a successful recycling program.

Diversified Recycling Systems (DRS) wants to help you find a system that will make your office recycling program work specifically for you.

From desktop or desktide recycling files, educational and promotional materials, to high traffic intermediate containers and mobile pick up of all materials, we offer a complete internal recycling system.

Call DRS today for the combination that fits your business, or business customers', recycling needs — from desktop to dock.



**Diversified  
Recycling Systems**

Office/Warehouse Products for Recycling

5606 North Highway 169, New Hope,  
MN 55428 (612) 536-6828



ever, we do take exception with the statement "If Ohio and Indiana are going to take crepe soles and pharmaceuticals made in New Jersey, isn't it fair that they take some of New Jersey's garbage?" The state that produces [a given] product receives the profits and the employment. Give our state these [same] benefits — we will take care of the waste.

*Chuck Hudson, President  
Green Hills Citizens for a  
Clean Environment  
Trenton, Mo.*

I had to comment on Bill Breen's article, "Truckin' Trash," in the Jan/Feb issue. A simple adjective in the second paragraph, describing the scent

of ripened garbage as "goatlike," destroyed my ability to concentrate on the rest of the article without attempting to enlighten Mr. Breen.

I've kept and bred goats for years. The does (slang name: nannies) and castrated males (wethers) are very clean, fastidious animals with NO NOTICE-ABLE ODOR of any kind. The bucks (billies) do have a musky odor during breeding season only — about six months of the year. This odor, while very strong, is as pleasant as a bouquet of flowers compared to a truckload of fermenting trash.

*Shirley Jarne  
Grass Valley, Calif.*

#### PROPYLENE VS. ETHYLENE

In your Jan/Feb issue you listed propylene glycol-based antifreeze under new environmentally sound products ["Keepers"]. Although this material is less toxic than ethylene glycol, there are other problems associated with its use.

Both types of antifreeze may become contaminated with toxic heavy metals when used. Therefore, either substance may be considered a hazardous waste, depending on the levels of those metals. Propylene glycol is a contaminant in ethylene glycol antifreeze-recycling

programs. While ethylene glycol recycling is becoming more and more available, propylene glycol recycling currently is not. Therefore, the choice is to use a more toxic substance (prior to use) and recycle it, or use a less toxic substance and flush it down the drain.

*Michael Rubin  
Redmond, Wash.*

#### WHAT GOES AROUND...

As a long-time user of tampons, I read with interest your report on their effects, both environmental and physiological ["The Truth About Tampons," Nov/Dec]. I have always



**The National  
Marketplace  
for the  
Environment**

**June 28 - 30, 1991  
Colorado Convention Center  
Downtown Denver**

**More than 100,000 sq. ft. of  
products and services friendly to the environment**

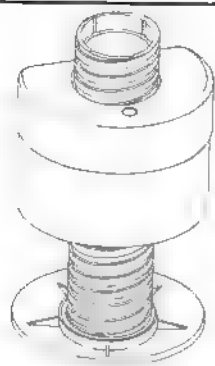
**PAVILIONS FEATURING:**

**recycling • natural & green products • alternative-fuel vehicles  
home & garden • energy • art • travel**

**NEW PRODUCTS ★ SHOW SPECIALS ★ SPEAKERS  
CHILDREN'S PLAY AREA ★ FILM FESTIVAL ★ DOOR PRIZES**

**For more information, call (303) 388-7235 or (818) 906-2700**





# Water Conservation Product

## The Mini Flush System

*A Patented Device*

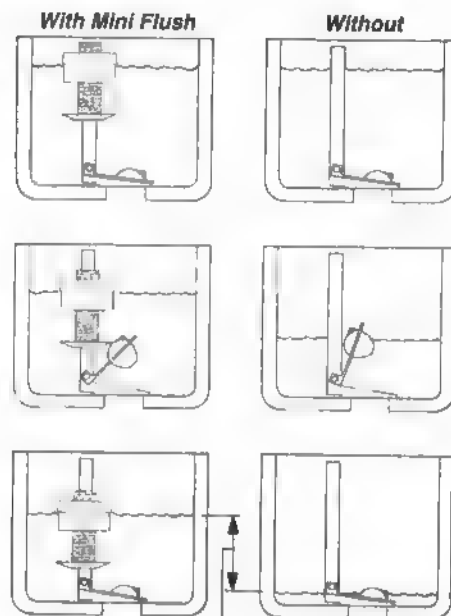
- Saves 2-6 Gallons per Flush
- Reduces Waste Water Flow
- Pays For Itself Quickly
- Installs in Seconds
- Fits Virtually Any Toilet
- Lifetime Warranty

**40,000 Systems already installed in:**

Residential  
Condominiums  
Apartment Houses

Hotels & Motels  
Owners Associations  
Commercial Buildings

*Distributorships Available*



**Water Saved, 2 to 6 gallons**

### HOW THE MINI FLUSH WORKS

When the handle on the toilet is depressed, as in the example shown, the flapper valve is opened fully by the upward pull of the chain. This initiates the process of flushing. With the Mini Flush System, the process is initiated in the same manner, generating full head pressure. After releasing approximately 1.6 gallons of water, the Mini Flush System, with a reduction of water volume, has now engaged the flapper valve. The water level and the unit continues to drop, through gravity, and begins to close the flapper valve. This force, combined with the vacuum created by the water leaving the tank, closes the flapper valve and prevents any additional water from escaping the holding tank.

### ORDER FORM

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE ZIP \_\_\_\_\_

( ) \_\_\_\_\_

PHONE \_\_\_\_\_

☐ 1 Mini Flush Home Installation Kit **\$19.95**

*includes: flapper valve, refill tube, clip, and the Mini Flush unit.*

☐ 2 - 23 Installation Kits **16.95/each**

☐ Case (24 Kits per case @ \$14.95ea.) **358.80/case**

☐ Send Dealer/Distributor Information with my purchase.

Quantity \_\_\_\_\_ x \$ \_\_\_\_\_ = \_\_\_\_\_

CA residents add 6.25% Sales Tax \_\_\_\_\_

Shipping & Handling **\$3.00**

TOTAL ENCLOSED \$ \_\_\_\_\_

Please send check or money order (sorry, no COD orders)

**Mini Flush Company, Inc.**

3960-K Prospect Avenue, Yorba Linda, CA 92686 • (714) 993-7332

**MINI  
FLUSH™**  
COMPANY, INC.



deplored the single-use nature of the product, but I used them for want of a better system. Now, after reading about the chemical and synthetic content of tampons, I have stopped using them. My alternative is to cut up, use, launder, and re-use the cotton diapers I used on my babies. Ah, the cycle of life....

Rebecca Cohen  
Winnetka, Ill.

#### BRONX CHEER

Your editorial ["Talk Talk ... Jan/Feb] said it all! Thank God for a voice of reason!

I received a solicitation from the Nature Conservancy mourning the de-

feat of the Environmental Bond Act (in the 1990 New York State elections) — not even considering that New York voters might value the environment too highly to entrust it to state bureaucrats.

Owen D. Camp  
Bronx, N.Y.

#### PLASTIC PROTEST

In your "Practical Journal," you used several pages to describe the mostly futile attempts at recycling plastics ["Recycling Plastics," Jan/Feb] but gave almost no practical advice on avoiding plastics. Disappointing.

Habib Rathle  
Yuma, Ariz.

#### GETTING CARDED

Have enjoyed your magazine since its inception. I'm looking forward to the day ya'll get into the credit-card business. I would love to carry a Visa card with **GARBAGE** blaz-ing across the top.

M A. Maxwell  
Johnson City, Tenn.

#### TIRED, BUT SMART

Keep up the good work (a tired phrase, but appropriate with your fine magazine). There are only four publications that I lose sleep over (meaning I stay up half the night the day they arrive, reading them) — **GARBAGE**, Old-House

Journal, National Geographic, and Consumer Reports.

Thanks again for a great publication, and don't give in to the wild-eyed, foam-at-the-mouths from either fringe. Plain, simple discussion of complex issues is needed if we are to even try to solve our problems.

Anthony C. Hill  
Yorba Linda, Calif.

#### CORRECTIONS

The water purifier shown on page 29 of the March/April issue is not a reverse-osmosis model, but a carbon-filtration model, made by Ametek.

The article "Home Water Purifiers" in the March/April issue misstated the price of Shaklee's Best Water System. It retails for \$375.

## UM'S Recyclable Waste Containers Make Recycling Safe, Easy and Economical

From Office To Municipal High Traffic Areas  
UM'S Recyclable Waste Containers Can Solve  
Your Toughest Recycling Problems!



- Consists of 26% or more recycled steel content.
- Over 90% post-consumer recyclable.
- Optional decals encourage the proper separation of trash.
- Wide variety of models, designs, finishes and capacities.
- Constructed of heavy-gauge fire-safe steel.
- Shipped fully assembled—ready to use.
- Made by American Craftspeople.

For **FREE COLOR CATALOG**, phone Sue Howard, toll free (800) 233-0314, ext. 220

**UM UNITED MARKETING INC.**  
UNITED METAL RECEPTACLE CORP. • HOWARD PRODUCTS

14th & Laurel Sts., P.O. Box 870  
Pottsville, PA 17901-0870  
(717) 622-7715 FAX (717) 622-3817

Your Single Source For Litter Control And Recycling • **MADE IN U.S.A.**



**Crestwood Paper**  
Is  
Pleased To Announce



**100% Post-consumer  
Recycled Paper**  
for  
any of your office  
printing needs

For information,  
fax on your letterhead to

**Greg Barber**  
at  
FAX: (516) 365-2726

## **Eight ways Sonoco is putting environmental smarts to work for you**



1. Recycling wastepaper for nearly a century.
2. Manufacturing products from recycled wastepaper since 1899.
3. Internal recycling of paper and plastic production scrap.
4. Developing new products from recycled paper and plastics.
5. Promoting in-store recycling programs for plastic grocery sacks.
6. In-plant recycling programs for paper and aluminum cans.
7. Consulting with local communities in establishing curbside recycling programs.
8. Corporate programs to advocate recycling, source reduction, waste-to-energy incineration and judicious use of landfills.

For a free brochure on solid waste solutions, write to Corporate Communications—I03, Sonoco Products Company, P.O. Box 160, Hartsville, South Carolina 29550.



**7pm...and  
all is NOT well.**

Formaldehyde

Household  
chemicals

Combustion  
gases

Pollen

Dust

**These people are  
breathing dirty air!**

**The Berner AQ Plus™ can  
solve this problem!**

*This unit can be installed by a home  
carpenter and is priced at \$599.00  
Wouldn't you enjoy "Sunshine Fresh",  
dust and pollen free air today?*

The AQ Plus™ unit, the size of a room  
air conditioner, will effectively clean and  
change the air in your home.



- Introduces fresh, pollen free air
- Removes chemicals & pollutants from indoor air
- Balances indoor humidity levels
- Conserves your energy dollars by heating cooling fresh incoming air to indoor air temperatures

Phone or write for unit or  
free brochure



Berner Air Products, Inc.  
PO Box 5410F New Castle, PA 16105

**1-800-852-5015**



## **WB Recyclers™**

### Receptacles for Office Recycling

Bold graphics and restricted openings clearly indicate WB Recyclers™ special function. Sturdy, all-steel construction confers fire-safe, UL approval.

### **Canables™** Recycling Receptacles

Lids designed for  
cans and bottles  
also available



Great for parks,  
streets, malls,  
vending areas.  
Tough steel barrels  
with plastic tops for  
use inside or out

Call toll-free  
and find out how  
our products can  
help your recycling  
program

**800-527-7848**



**WINDSOR**  
Barrel Works

Box 47, Kempton, PA 19529  
(215) 756-4344



## **MAKE PROTECTING THE ENVIRONMENT YOUR JOB**

*The Job Seeker* specializes  
in environmental and natural  
resource vacancies nationwide.  
Two issues each month are filled  
with current vacancies from  
Federal, state, local, private, and  
non-profit employers. A six  
issue trial subscription is only  
\$19.50. **Subscribe today!**

*The Job Seeker*  
Dept J  
Rt 2 Box 16  
Warrens, WI 54666

## **THE RIBBON FACTORY**

**Manufacturers of Computer Printer Ribbons  
Supplies for the Computer Professional**



**Save your old Printer Ribbons  
and Laser Cartridges**

**We can reload your  
old ribbons and  
cartridges and save  
you as much as half  
the cost of new ones.**

Printer Ribbons  
FAX Supplies  
Magnetic Media  
Diskettes, Tapes  
Forms, Recycled Paper  
Cleaning Supplies

**(702) 736-2484 (800) 275-7422**

## **CANVASACK**

**The environmentally sound  
alternative to paper or plastic bags**

- 100% natural cotton canvas 10 oz.
- Large capacity 15" x 12" x 7"
- Wholesale inquiries welcome
- Money back guarantee
- Machine washable
- Made in USA

**\$6.99 each  
or 2 for  
\$12.99**  
plus \$2<sup>50</sup> S&H  
(add 50¢ S&H  
for each bag  
over two)



To order

send check or money order to:

**CANVASACK**  
4807 So. Mountain Lane  
Salt Lake City, UT 84124  
(801) 277-3256

(UT residents please add 44¢ per bag sales tax)



## ELECTROMAGNETIC RADIATION

### Measurement And Control

Our Model EM1™, an affordable, high quality, accurate ELF gaussmeter (shown above), is ideal for non-technical users, especially homeowners and parents. It's also cost-effective for initial survey use by businesses and professionals.

Our Model EM100™, a state-of-the-art ELF/VLF engineering/scientific gaussmeter, is easy to use, but offers technical capabilities to complement the most knowledgeable user.

### Schaefer Applied Technology

For the name of a nearby dealer, to request a brochure, or to order direct (MC/Visa), call (800) 366-5500, ext. 237

# One Simple Thing You Can Do To Save The Earth.

**WeCare**  
The Earth-Friendly Catalog  
1-800-356-4430

## QUADRA-PAK®



## Sizzle-Pak®

### ECO-PACK INDUSTRIES, INC

Introduces an environmentally responsible solution to your packing needs. QUADRA-PAK® and SIZZLE-PAK® will enhance any packaged products, while also affording superior protection and reduced migration.

Best of all, our products are **RECYCLABLE** and **BIODEGRADABLE**.

If you care about quality packing performance and our environment... Call us today to learn more.



**(206)251-0918**

ECO-PACK INDUSTRIES, INC.  
7859 South 180th Street  
Kent, Washington 98032



No. KDS101



No. KDS201



No. KDS301

## It's Never Too Early and It's Not Too Late!

A Small Contribution To A Global Effort

### The Kids in the Neighborhood

- Special Edition Prints • 17 x 17 • \$20.00 per print •
- 16 Matching Postcards • 4 x 5 1/2 • \$3.00/pkg. •
- Printed and packaged in recycled stock

**Art Prints**  
KDS101 Neighborhood Clean-up Patrol  
KDS201 Collection Day  
KDS301 Think Green!  
KDS303 Think Green! T-Shirt 100% cotton (S M L) \$16.00

**Postcards**  
KDS102  
KDS202  
KDS302

Shipping: Up to \$10.00 add \$1.50, over \$10.00 add 15% for each address.  
(North Carolina residents please include 5% sales tax.)

Send your order to: **MGB Press**  
P.O. Box 8787 Greensboro, NC 27419  
(919) 852-4287

Please allow 4-6 weeks for delivery

G5/91



# Pig-Time Farming

## PROFILE

**Boston farmer Lee Lawrence Albright and the family pet, Absolutely Lovely.**

**A**bsolutely Lovely weighs 175 pounds. She lives where patches of watermelon, pumpkin, strawberries, and raspberries lie hidden between the ribs of bedrock which typify New England farmland. She eats the trimmings from home-grown broccoli and eggplant which are too good for the compost pile.

All in all, Lovely is happy as a pig in ... Boston.

Consider her neighborhood: Brookline, where the streets are lined with stately brick houses and people shop at upscale stores. This is a wealthy neighborhood where most things conform. The family pet should be a golden retriever named Spence. But behind a grove of pine trees, this is where Lovely lives.

Welcome to Allandale Farm, the last working farm inside Boston city limits. It has been farmed continuously since the 1600s. Meet Lovely's family, the Lawrences, who have kept the 250-acre, classic Yankee homestead going since the 1800s. Meet the neighbors, who long ago gave up their tractors in favor of purring Volvos.

Lee Lawrence Albright, one of four Lawrences who still call the farm home, says her popularity dips whenever she spreads chicken manure over the fields. (The farm tries to avoid chemical fertilizers



and pesticides.) But giving city folks a whiff of what life is like down on the farm is one of Ms. Albright's objectives.

"Our feeling is that [open] land is unique [so] near an urban center. If we can keep this land open, we're making a big contribution," she says. This isn't something most people worry about in Massachusetts, where development pressure is powerful, and 50 percent of the state's farmland has been paved over and built up since the 1950s.

In a town where a quarter-acre plot can fetch \$200,000, Allandale Farm (worth hundreds of millions as builders' lots) gets its share of the development squeeze. The Lawrence family is determined to hang on, even though the farm requires annual earnings of \$375,000 to keep it from the auction block.

"It's difficult for a family — especially a couple of generations into it — to hold onto a project of this sort and maintain a working relationship with each other," says farm manager John Lee, related by marriage, who's seen the demise of other family farms in New England. One developer, who wanted to turn part of the farm into a golf course, offered each family member a house by a fairway and a free club membership.

Ms. Albright has other ideas. For 20 years she's run a preschool program at the farm, where city kids can soak up the open space, and gain some environmental awareness by seeing, firsthand, things like composting and recycling.

Besides Yankee grit and family harmony, what's kept the family farming? Lee Lawrence Albright credits state laws that encourage farmers to keep land under cultivation by threatening financial penalties and back taxes if property is taken out of an open-space program.

"These laws were designed to keep family farms going," she says. "Otherwise, I don't think you'd see a farm left in Massachusetts."

Let alone a pig in Boston. — Tom Verde

Tom Verde is a writer living in Boston. He's written for National Wildlife, Yankee, and National Public Radio.

## • Juice Boxes Revisited

After Maine banned aseptic packages — those multi-layered, laminated juice boxes — in September 1990, two package makers got busy. Tetra-Pak and Combibloc quickly set up pilot recycling programs in six states, and took out full page ads in the *New York Times* and the *Wall Street Journal* to tell the world about it.

New York City's Department of Consumer Affairs also works quickly. Nineteen days after the ads ran, Consumer Affairs charged the juice-box makers with deceptive trade practices and ordered them to stop running the ads, which claim that juice boxes are easily recycled. In fact, there is no NYC facility for recycling the boxes.

## FOR THE RECORD

*"Perhaps GARBAGE isn't quite the absurdity it seemed. It's still being published..."*

From a story about the demise of Campbell's Souper Combo, whose over-packaging landed it in *The Dumpster*. (Packaging Digest, February, '91)

## GARBAGE DICTIONARY

**Dump Duck**, noun. No, it's not a breed of duck that waddles across garbage heaps, gobbling rubbish. "Dump ducks" is what Downeasters (that's folks who live on the coast of Maine, excluding yuppies) call gulls — sea gulls, chowderhead.

Why? Good question. "This is too modern for me," says John Gould, author of *Maine Lingo*. "When I was a boy, there were no sea gulls on the dump — people would never throw garbage [food waste] on the dump."

Bob Fernald, the sea-urchin diver from whom I first heard the term, is also at a loss, but he attempts a theory: "When I see a gull on the ocean it's a pretty bird. But when I see it in its usual context — fighting over french fries at McDonald's ... I don't know — 'dump gull' doesn't have the right ring to it."

Wordsmith Gould takes the new term in stride. "It's not surprising. Sea gulls get various names that don't belong to them," he says. "The fishermen call them shit-pokes. They don't like what gulls do on their decks."

— Hannah Holmes





## FOR THE RECORD

**"My foot is ozone friendly, but what does that mean?"**

Andrew Stoeckle, environmental analyst, on Gillette Foamy's "ozone friendly, no CFCs" claim — CFCs have been banned from aerosols since 1978. (New York Times, March 11, '91)

## • Sssh! Don't Tell Kodak!

Lake Ontario is Toronto's water supply. People cook with it, bathe in it, drink it — there are a thousand ways to use it.

Make that 1,001.

Toronto photographer Jeremy Lynch develops his photos with water taken from the lake. He doesn't spend money on pricey developers — Lake Ontario

contains enough of a chemical soup to do the job without Kodak's help.

"It has to do with hydroquinone," Mr. Lynch says. "It's a stabilizer in diesel fuel and paint thinner, and the main component in developer."

Mr. Lynch took water from 20 different parts of the lake before finding an area — near a shipyard — that worked. It takes him

about 28 hours to develop a Lake Ontario-immersed negative.

Now he's sampling the waters at other photogenic spots, like New York City Harbor, where a development time of 26 hours compares favorably with Toronto.

The best spot so far? "Love Canal," says Mr. Lynch. "It took three hours."

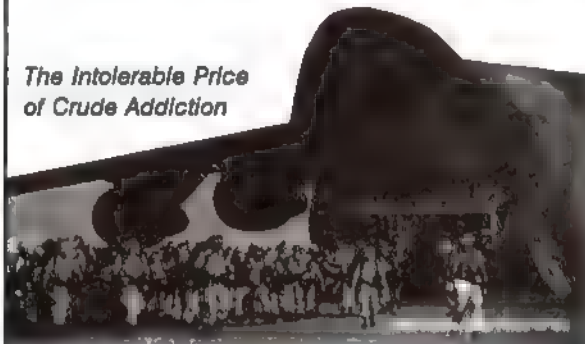
## • PET of the Year

It's a new age in the Cola Wars: Both Coca-Cola and Pepsi have developed methods to recycle used PET plastic bottles into new PET bottles. Coke's technology has just been OK'd by the FDA. Pepsi expects to get the green light soon. Both companies promise to market bottles made partly from recycled plastic this year, making it the first time a recycled plastic is used for food containers.

Although PET is easily recycled into ski-jacket fill, carpeting, and other neat stuff, "closing the loop" — the process of recycling products into what they were the first time around — greatly reduces demand for fossil

## Put Your Sun to Work at Home!

The Intolerable Price of Crude Addiction



Get smart America! Simple, inexpensive energy-saving measures will end our country's addiction to oil. It's good for the planet, good for the economy, and won't spill even one drop of blood!

Since 1978, Real Goods, the world's largest supplier of energy efficient products, has solar-electrified over 10,000 homes. Send \$10 for our 400 page 1991 Alternative Energy Sourcebook, or call 1-800-762-7325 for our free catalog.

- Solar-Electricity
- Super Efficient Lighting
- Energy & Water-Saving Appliances
- Recycling & Non-Toxic Products
- Educational Toys & Gifts

CALL FOR OUR FREE CATALOG

**1-800-762-7325**



**REAL GOODS**

since 1978

966-G Mazzoni St., Ukiah, CA 95482



3kW Energy Independent Solar Home by Real Goods

**HERE'S WHY  
IT'S AMERICA'S  
No. 1 COMPOSTER**



The attractive, easy-to-use, high-efficiency SOILSAVER turns household waste into a steady supply of rich, dark humus. Now it makes more sense than ever to recycle.

*At your hardware stores and garden centers.*

RECYCLING BEGINS AT HOME

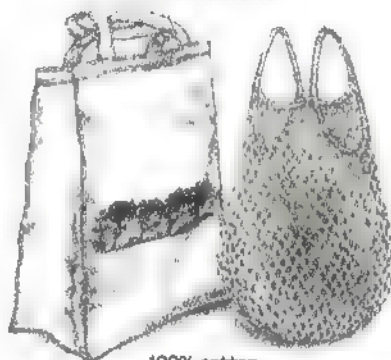
**SOILSAVER**

Barclay Recycling Inc.



**Earth Products**

for a cleaner safer environment



100% cotton

- Paper Sack style (natural)  
17 x 12 x 7" — \$4.99
- Cotton Mesh (natural)  
18 x 18" — \$2.99 or 3/\$8.95  
— \$2.00 shipping —

To order call 1-800-875-0224  
VISA AND MASTERCARD ACCEPTED

Using our bags help

- Promote recycling • Reduce waste

# WE'VE HELPED NEARLY 500 COMMUNITIES CLEAN UP THEIR ACT

In most cases, American homes contain dozens of household waste products. In fact, it is estimated that the average household contains between ten and fifteen gallons of hazardous waste materials.

In an effort to prevent household hazardous wastes from finding their way into local sanitary landfills and water sources, many concerned citizen groups and city leaders are aggressively seeking ways to organize hazardous waste programs.

Laidlaw Environmental Services is one of the nation's largest organizations committed to the effective management of household hazardous wastes. We create responsible community partnerships to educate people about the dangers of household waste. Laidlaw Environmental Services has helped to organize, and has participated in, hundreds of waste collection programs across the country. Laidlaw Environmental Services can help solve your household hazardous waste problem.

If your community is considering organizing a collection program, we encourage you to contact Laidlaw Environmental Services at 1-800-356-8570. Our Manager of Household Hazardous Waste is available to answer your questions about conducting a waste collection program in your area.

**JOIN US**

**L A I D L A W**  
**ENVIRONMENTAL**  
**SERVICES INC.**

Laidlaw Environmental Services Inc.  
P.O. Box 210799, Columbia, South Carolina 29221  
1-800-356-8570



## FOR THE RECORD

*"Ultimately, their kids will make them do it."*

George Dreckmann, Madison, Wis., recycling director, predicting that recycling-resistant parents will be won over. (Isthmus, Jan. 25, '91)

fuels and mineral additives. But simply shredding and washing a plastic like PET (polyethylene terephthalate) doesn't get it clean enough for food. The solution? Take apart the long-chain polymers that comprise PET (Pepsi calls it "unzipping") and put them back together as new plastic.

Jackie Prince, staff scientist with the Environmental Defense Fund, says both soda companies use methanol and other benign solvents to break down the PET polymer. "The technology itself is fine," says Ms. Prince. "It's a step in the right direction."

Pepsi's bottles will originally contain 10- to 20-percent recycled plastic; Coke hasn't determined a ratio yet. Both companies say the real-world percentage depends on available supplies of used PET.

## • Demographically Speaking ...

What type of person recycles? In Maine, country folks and older people are far more likely to sort and separate than under-35, citified types.

Barbara Nash of Market Decisions, Inc., which polled 400 Mainers, says that 56 percent of people 65 and over recycle, compared to 37 percent of those under 35. "Older people have the time, and ... they also feel pride and a responsibility to the state," Ms. Nash says.

What's more, 48 percent of the state's rural people recycle, while city dwellers recycle at a wimpy 27-percent rate. The reason? Backwoods people know garbage. Many do their own trash hauling — to the town dump or the local transfer station — and they're sensitive to what's reusable, what's recyclable, and what gets tossed.

But there's plenty of room for improvement: 40 percent of the poll's respondents said that once it's picked up, they don't know what happens to their trash.

## SYSTEM 1 Filtration 1 way to stop polluting our environment.

900,000 filters are thrown away daily according to the U. S. Census Bureau.

make the right choice and call us today for applications.

**SYSTEM 1**  
FILTER SYSTEMS  
National (800) 554-3533  
(209) 732-1955  
1822A E. Main St., Visalia, CA 93291

Reusable  
Stainless steel  
MICRO-1 filters are  
easily cleaned with  
soap and water or  
bio-degradable cleaners





**Orjene**  
NATURAL COSMETICS

## The Source of Natural Beauty

**ORJENE NATURAL COSMETICS** brings you the best that nature can offer—beauty care products that work, with ingredients you can trust and understand.

Our philosophy has always been **NO ANIMAL TESTING**—to work with nature not against it.

Send \$1.00 for our NEW 24 page catalog featuring unique formulations of selected botanicals, organic oils, exotic blooms and beautifying vitamins.

All our products are free from mineral oils and artificial colors.

Write to:  
**ORJENE NATURAL COSMETICS**  
DEPT GM  
5-43 48 Ave., Long Island City NY 11101  
Te (718) 937 2666

# Shop Green—the earth depends on it.

## THE GREEN CONSUMER SUPERMARKET GUIDE

BRAND NAME PRODUCTS THAT DON'T COST THE EARTH

Best buys for a healthy planet!

- Buy wisely in every aisle of the store
- Choose safe produce
- Cut through label hype
- Rate your own supermarket
- Demand greener products

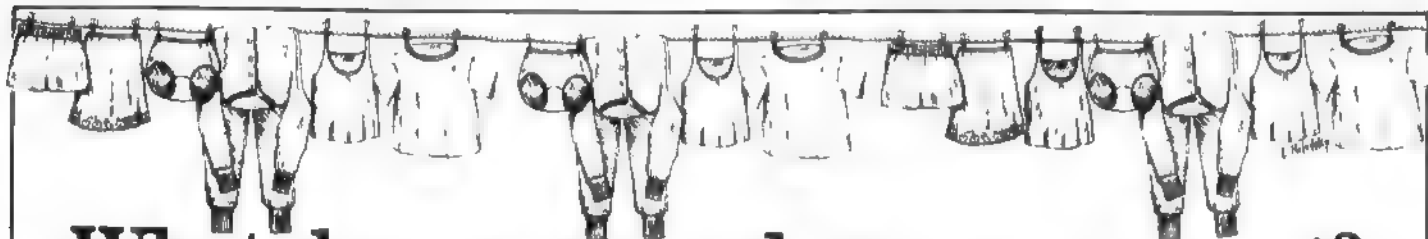


**JOEL MAKOWER**  
with John Elkington and Julia Hailes

*The Green Consumer Supermarket Guide* takes you down every aisle of the store to help you buy wisely while you save the earth.

From the authors of *The Green Consumer*—“An indispensable guide to environmentally safe shopping.” (*USA Today*)

For the best in paperbacks, look for the **PENGUIN**



# What does your underwear support?

Think about the last time you bought underwear... What did you know about the company that made it? Do they protect the environment? Do they invest the money you spend with them building nuclear weapons or supporting apartheid?

Too often, your money works against you, going to businesses that you probably don't want to support.

But it doesn't have to be that way. When you join Co-op America, you can choose where your money goes, and what it works for.

At Co-op America, we do the homework for you. By joining, you get the tools you need — from a catalog of responsible products to travel and investment advice — to make every dollar you spend work for peace, cooperation, and a healthy environment. Plus, you get our magazine, access to health insurance, networking tools and more.

*Remember, you can use your buying power to work for your values.*

Send in this coupon today for FREE information on a Co-op America membership, or send in \$20 and become a member right now.

I want to be part of  
**YES! COOP AMERICA**

- ☐ Enclosed is my \$20 membership fee.  
☐ Please send more information

Name \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Mail to: Co-op America, 2100 M St., N.W., Suite 403, Washington, DC 20063 (202) 872-5307 or (800) 424-COOP

GA3



# WE SPECIALIZE IN MAKING BAGS

*A Commitment To Quality & Down-To-Earth Prices*

Made in Williamsport, PA from handsome, domestic 10 oz. canvas with reinforced cotton web handles, our grocery bag measures 16" x 12" x 8". The response to this bag has been so encouraging, we now produce.

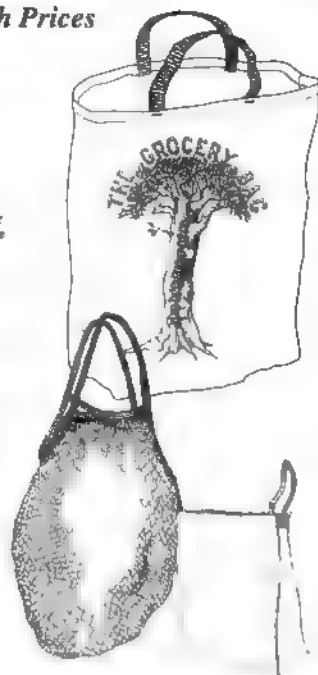
	Each	4 or more
<b>Canvas Grocery Bags</b>		
As above .....	5.25	4.75
<b>Canvas Lunch Bag</b>		
7" x 5" x 10" with velcro closure .....	3.50	3.25
<b>The Large Cotton String Bags</b>		
Strong handles, about two thirds capacity of grocery bag .....	3.75	3.50
<b>Extra Large, Shoulder Carry Cotton String Bags</b> .....	7.75	7.25
<b>Canvas Pouch for Mesh Bags</b> .....	3.00	2.75
<b>14 oz. Canvas Recycling Bag</b>		
30" x 16", with drawcord and haul strap .....	17.00	15.00

\$3.00 shipping and handling for any size order.  
MC/Visa accepted

**(717) 322-5900**

or send your order to:

**EQUINOX Ltd.**  
1307 Park Ave.  
Williamsport, PA 17701



## PROMOTE ENVIRONMENTAL AWARENESS & ACTION



Send for free catalog of fundraising resources such as colorful T-shirts, buttons, rubberstamps & much more. Any of above 100 % cotton T-shirts \$11.00 postpaid.



**ENVIRONMENTAL RESOURCE PROJECT**  
P.O. Box 600-G  
Bayside, CA 95524  
(707) 822-1636



**What kind of a world do you want?  
Environmentally Sound? Peaceful?  
With Equal Opportunity?**

Then consider **PAX WORLD FUND\***

Pax World is a no-load, diversified mutual fund designed for those who wish to develop income and to invest in life-supportive products and services. The Fund does not invest in weapons production. IRA plans available. Minimum investment \$250.

\*Pax World Fund is the only mutual fund in the nation affiliated with a Foundation that, for eight years, has supported tree planting in areas of the deforested Third World. This is not a solicitation in those states where the securities have not been qualified.

A prospectus containing more complete information about PAX WORLD FUND, including all charges and expenses, will be sent upon receipt of this coupon. Read it carefully before you invest. Send no money.

To PAX WORLD FUND, INC. **1 (800) 767-1729**  
224 State Street, G-4  
Portsmouth, N.H. 03801

Please send me a free prospectus and information on Pax World Fund

- ☐ Regular Account  
☐ Send IRA Packet  
☐ Simplified Employer Pension Plan  
☐ 403 (b) Pension Plan

Name

Address

City Zip

Occupation

Telephone No ☐ Day ☐ Evening

## MATS

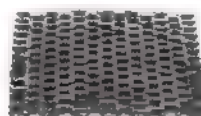
*Made From Recycled Tires*

### Weight Lifting Mats

Protect floors from weights. Mats will hold in place when laid flat. Black textured, non-slip surface. 4'x6' SOLID RUBBER, 1/2" for \$66.95 or 3/4" thick for \$85.95. (Approx. wt. 110 lbs.) You pay s&h on arrival.

### Tire Link Doormats

Maybe the last doormat you'll ever need to buy! Steel reinforced links. Stops mud in its tracks. You pay s&h on arrival.



14x22 = \$ 7.95  
16x22 = \$11.95  
18x30 = \$18.95  
21x34 = \$22.95  
24x37 = \$27.95

### Microwave Oven Leakage Detectors

Is your microwave leaking radiation? The Microcheck is easy to use, no leads or switches to set and needs no batteries. Reads from 0.1 to 1 milliwatt/sq.cm. Use: A warning device only, not for lab. or scientific work. Only \$28.95 to be sure! (2.3 oz.) Free s&h!



(RI add 7%) All Products Are Guaranteed!  
Free catalog available  
Mail check or m/v, and sizes today.

### Earth "N" Us

Box 533 Suite G  
W. Warwick, RI 02893  
(401) 823-1081

# COMPLETE THE CYCLE. BUY RECYCLED.

A lot of paper being sold today as "recycled" is really made of manufacturing waste-paper—which has always been used to make new paper.

If we want to have an impact on the landfill crisis,

we need to buy paper made with post-consumer waste.

We are pleased to carry Fort Howard's "Envision" line which includes unbleached toilet tissue made of 100% post-consumer waste-paper.

Give us a call.

- ★ Envelopes
- ★ Fax Paper
- ★ Copy Paper
- ★ Legal Pads
- ★ Printing Paper
- ★ Computer Paper

**Atlantic  
Recycled  
Paper Co.**

- ★ Napkins
- ★ Paper Towels
- ★ Toilet Tissue
- ★ Facial Tissues
- ★ Mailing Labels
- ★ Loose Leaf Paper

For free catalog, call 301-323-2676

P.O. Box 39096, Baltimore, MD 21212

100% Post Consumer Printing Paper Now Available

**Seventh Generation**  
Products for a Healthy Planet

**Why use recycled paper products? Aren't trees a renewable resource?**

Trees are a renewable, but limited, resource that won't supply our needs indefinitely. The United States is already the largest consumer of wood products in the world and demand is expected to rise 50% in the next 10-20 years.

**Why is unbleached paper best?**

Paper manufacturing pollutes our air and water. When paper products are

bleached with chlorine, highly toxic dioxins are created which can pollute our air and water and remain on the paper products themselves.

**What can I do?**

Use recycled paper. It takes less energy and water to produce, and doesn't require bleaching. **Seventh Generation** offers a complete line of recycled paper products, including unbleached toilet paper, facial tissues, paper towels and more.

Call 1-800-456-1177 to get your **FREE Seventh Generation Catalog** of information about these and more than 300 other environmental products.

**Yes! Send me a FREE catalog today!**

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ St: \_\_\_\_\_ Zip: \_\_\_\_\_

Seventh Generation, Dept. MO6025, Colchester VT 05446-1672

**MAGNETIZER**

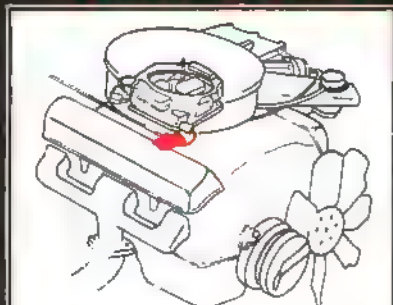
**FUEL ENERGIZER**

For Gasoline Cars & Trucks

- USERS REPORT FUEL EFFICIENCY INCREASES UP TO 25%
- GET HI-OCTANE PERFORMANCE FROM REGULAR GASOLINE
- CLEANS AND PREVENTS CARBON AND VARNISH BUILDUP
- A SNAP TO INSTALL — SEE INSTRUCTIONS INSIDE
- NEVER NEEDS TO BE REPLACED
- REDUCES EMISSIONS UP TO 70%

**SAVE HUNDREDS A YEAR**

UNLEASH YOUR ENGINE'S POTENTIAL



The Magnetizer unit is shown in red. It has been placed on the fuel line as close to the carburetor as possible.

**\$99<sup>95</sup>**

Send Check or Money Order to:

**NATIVE ENTERPRISES**

309 5th Ave., Suite 420  
Brooklyn, NY 11215  
(718) 832-5260

**MONEY BACK GUARANTEE**

**MADE IN THE USA**

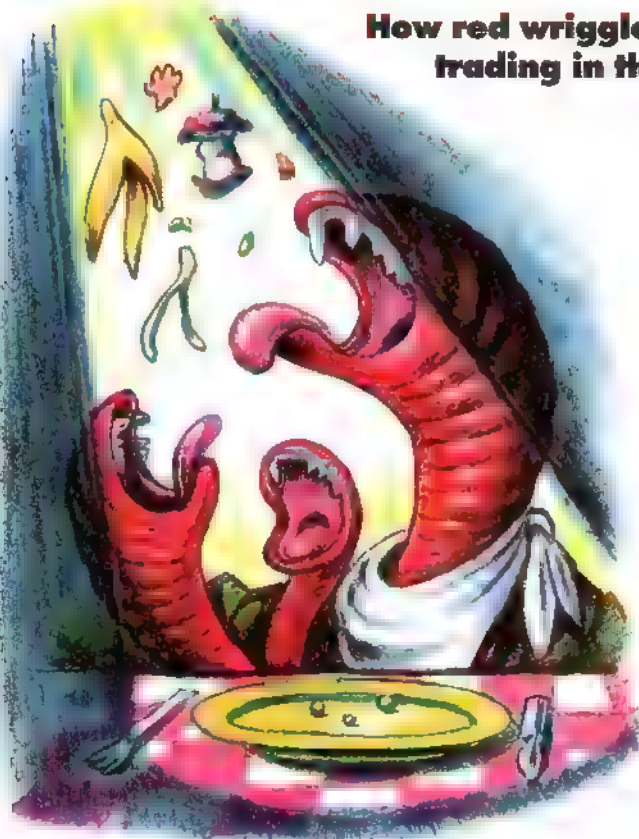
NY RES +TAX

**10% OFF**  
With This Ad

Mileage may vary depending on age and condition of auto and drivers' habits.



## How red wigglers can help you compost; trading in the power mower for the old push model.



**Q:** Being an apartment dweller, I don't have my own yard. What do you suggest I do with biodegradable waste? Can you discuss small-scale compost, too? (What goes with what, and where?)

Maira Malone  
Queensbury, N.Y.

**A:** Tough problem. Compost bins, no matter how discreet, often just don't fit in on the grounds of apartment buildings. If the building super gives permission for some out-of-the-way place to make compost,

use a sturdy, prefabricated bin with solid sides and a tight-sealing lid to keep unwanted critters — dogs, cats, and kids — out.

You'll reduce the chance of weird smells and ravenous animals if you skip the meat and bone scraps. Kitchen scraps are so moist and rich in nitrogen that they may become an anaerobic slime-pile, something more resembling the Creature from the Black Lagoon than pure forest loam. So you'll have to add dried grass clippings, leaves, straw, or shredded newspaper to keep the compost well aerated, and to balance the nitrogen with carbon.

All this is to say that composting in an apartment setting is problematic, at best. You'd be wiser to try red worms, a.k.a. "red wigglers," or *Lumbricus rubellus*, to digest your kitchen scraps. (Stay with me.) Worms don't take up much space. A two-foot by four-foot box will take care of the scraps of two to three adults (figure on one square foot of surface area in the worm bin for each pound-per-week of food scraps). Worms are circumspect. They do their thing in dark, not-too-cold places like the boiler room, under the kitchen sink, in the broom closet, on a utility porch, or in a garage. If you want to use the worm bin all year, make sure it doesn't freeze. Worms prefer temperatures above 50 degrees Fahrenheit.

Make bedding for the worms from strips of newspaper, corrugated cardboard, shredded office paper, sawdust, or leaves. The lid on the bin must be well sealed to keep out flies. Just dump your scraps under the bedding where the shy creatures reside. In less than a year, you'll have a very rich, concentrated organic fertilizer called "castings" (scientific talk for worm poop). If you don't have potted plants, wrap your castings in pretty paper, and present them to friends who have gardens. You don't even have to tell them what they're getting.

For extensive information on both composting and worming, see my article "Garbage to Compost," Nov/Dec 1989.

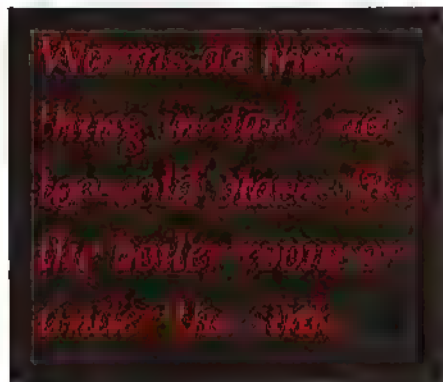
— Robert Kourik

**Q:** I am very interested in acquiring a hand-push lawn mower, the old-fashioned kind without an engine. Do any companies offer new versions of these?

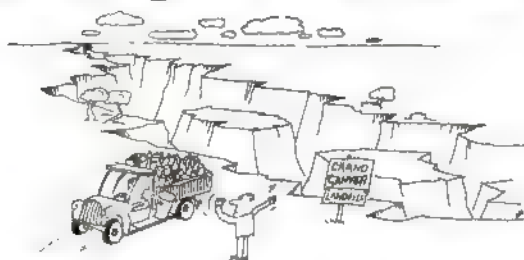
Jill Sculerati  
San Angelo, Texas

**A:** Push mowers aren't exactly a thing of the past — you may not need to search further than your local hardware store or garden center.

The reasons to own a push mower are numerous: They're quiet, and they don't produce fumes. Their blades act like scissors, snip-



## Another Reason We Print On Recycled Papers With Soybean Inks



**Alonzo Printing, Quality Open Web Specialists**  
1094 San Mateo Avenue, South San Francisco, California, 94080  
415-873-0522 FAX 952-1438 Modem 873-4812

### RETAILERS...

Offer your customers an  
environmentally-sound choice  
and save money on paper  
and plastic bags with the

**EcoSac**  
Shopping System

- Free display rack and  
guaranteed sales program  
with purchase of starter kit

Call 1-800-926-1017, blue rhubarb, Inc. for details



Use your Visa or Mastercard



**EXTRA! EXTRA!** Ingenious Invention  
Saves Newspaper Readers' Sanity. Age-old  
problem solved by The Original Paperboy

**EXTRA! EXTRA!** Finally, a holder that  
makes it easy to bundle & recycle  
newspapers. Unique reach-thru design  
makes bundle tying a cinch.

- Durable easy-fold cardboard construction
- An environmentally responsible product

**EXTRA! EXTRA!** Get yours here for \$8  
postpaid, two for \$14 (WI residents add 5%)

- Quantity Discounts
- Custom Printing
- Excellent premium or fundraiser item.

Send check or money order to:  
**Paperboy Products, 601 Glenway Street**  
Madison, WI 53711. (608) 233-5556  
Reps, Wholesale, Retail opportunities.

Patent Pending

Made in USA

## STOP JUNK MAIL

### HOW?

#### Think about it...

*More trees are cut every year in this country  
for paper than in all of the clear-cutting in the  
Brazilian Rainforest combined!*

**Our program will allow you  
to stop the majority of  
unsolicited, promotional mail  
you receive daily.**

This is a real opportunity to help prevent  
more deforestation and destruction of our  
precious ecosphere, while benefiting  
yourself by no longer having to deal with  
endless unwanted mail.

Send \$5 cash or money order to stop junk  
mail today, (no checks please) to:

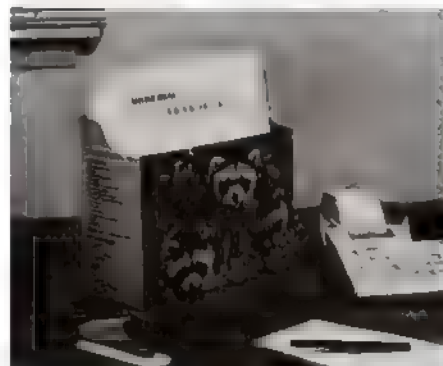
**STOP JUNK MAIL**  
3020 Bridgeway, Suite 150-A  
Sausalito, CA 94965

Include a list of the various ways your name appears  
on junk mail. We will respond to your order promptly.

# Office Paper Recyclers

TWO CLEVER,  
ATTRACTIVE WAYS TO  
START RECYCLING

### THE RACCOON DESK TOP RECYCLER\*



- Desk top recyclable paper that  
normally would be discarded
- RACCOON item shipped from stock
- Custom printing available
- Also offered in plain white corrugated.

### INTERMEDIATE RECYCLER\*



- Custom printing available

\*Items as shown, available from stock

**ACTION**  
**PACKAGING SYSTEMS, INC.**

374 SOMERS ROAD, ELLINGTON CT 06029  
(203) 872-6311 FAX (203) 875-4293

THESE PRODUCTS ARE MADE  
FROM RECYCLED MATERIALS.



*Keeping a push mower in motion burns enough calories to justify a bowl of ice cream.*

ping the grass cleanly, whereas power-mower blades cut grass by hitting it hard at high speed, essentially ripping the tops off. The cleaner cut is less damaging to each blade of grass, reducing the number of places where disease

can enter. Most important, keeping a push mower in motion burns between 400 and 500 calories per hour — enough to justify a large bowl of ice cream when the lawn is done

Unlike the wooden T-handled versions from yesteryear, many of the new mowers feature metal-tub-

ing handles that can accommodate a bag for clippings (the debate over bagging vs. leaving clippings rages on). The height of the blades can also be adjusted. The prices range from about \$90 to \$200, plus shipping, which is in the \$10 range. If push mowers have been relegated to museum-artifact status in your community, you can buy one through the miracle of mail-order. The following catalogs carry them:

The Energy Store (battery chargers, bike trailers, energy- and water-saving do-dads), P.O. Box 3507, Dept. GM, Santa Cruz, CA 95063-3507; (800) 288-1938.

The Natural Gardening Company (gardening implements), 217 San Anselmo Ave., Dept. GM, San

Anselmo, CA 94960; (415) 456-5060.

Lehman's Non-Electric Catalog (butter churns, kettles, woodstoves, windmills, cherry pitters, etc. — a great read), 4779 Kidron Rd., P.O. Box 41, Dept. GM, Kidron, OH 44636; (216) 857-5441.

## GOT A QUESTION?

Write to: Questions Editor



*Sorry! Due to the volume of questions we receive, we can't provide individual responses.*

## 100% COTTON SHOPPING BAGS

-an environmentally safe option-

• **Factory Direct Prices** •



- \* **Printing Available - up to 6 colors**
- \* **\$2<sup>00</sup> each on 1000 bag order**
- \* **30+ Years Contract Sewing Experience**
- \* **Quantity Discounts**
- \* **1 case Minimum (50 bags)**

**PIEDMONT PRODUCTS**

412 South Main  
Piedmont, MO 63957  
FAX 314-223-7336

## URBAN FOREST

PACKAGING PRODUCTS

Innovative, new, low-density paper packaging from 100% post-consumer waste for packaging fragile items. Provides void filling, shock absorption and cushioning. Environmentally responsive replacement for plastic wrap, foam and peanuts.

**Urban Forest Packaging Products**

1222 W. Spring Street  
Brownstown, Indiana 47220-1099  
Phone: (812) 358-3150



100% RECYCLED PAPERS

**FOR INFO CALL 800-348-BAGS**

## The Air You Breathe Is Our Business.

For over 15 years our customers have enjoyed relief from indoor air pollution in their homes, offices, and cars. If you suspect you suffer from indoor contaminants or from the growing concern over "Sick Building Syndrome," call us!

- Activated Carbon Purifiers
- Foil Vapor Barrier
- Whole-house Central Purification
- Hepa Filters
- Face Masks
- Water Filters

• "The Experts' Choice..." says *The New York Times*

• Environmentally Safe... —  
No Plastics, No Ozone

**E. L. Foust Co., Inc.**

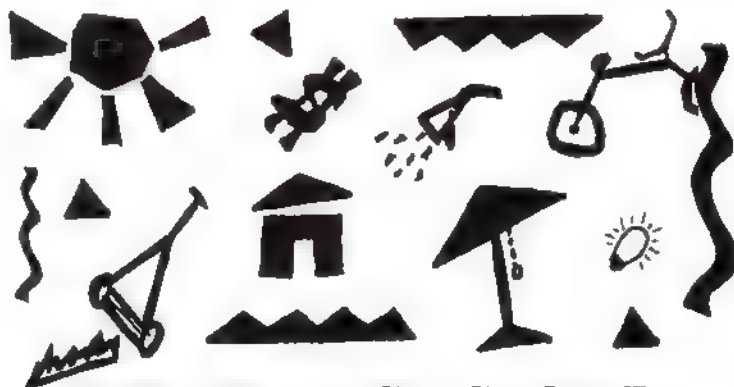
BOX 105, ELMHURST, IL 60126

1-800-225-9549

# SAVE ENERGY

Energy Efficient Products For The Home

Lighting • Heating • Cooling • Garden • Solar • Books • Kitchen Appliances



**THE ENERGY STORE**

1-800-288-1938

For a Free Catalog Call or Write:

P.O. Box 3507 • Santa Cruz • California • 95063-3507

EXTRA Special Videos from Children's  
Television Workshop's award-winning science  
series, 3-2-1 Contact!



**Down the Drain.** 3-2-1 Contact dives right  
in to take a close look at one of our most important  
resources—water. A 30-minute 3-2-1 Contact  
video Extra. \$18.45



**Bottom of the Barrel.** 3-2-1 Contact digs  
up the facts about oil and why we're running out of  
it. A 30-minute 3-2-1 Contact video Extra.  
\$18.45

To order:

Call 1-800-822-1105 — Operator #12  
(Credit Cards Only)

Or send Checks or Money Orders for the Full Cover Price\*  
to:

VCA-DTD/BDT  
50 Leyland Drive  
Leonia, NJ 07605

\*NY and NJ residents, please add sales tax.

## WHICH MUTUAL FUND KNOWS THE DIFFERENCE BETWEEN ACID RAIN & THE GREENHOUSE EFFECT?

Our investments include:

- Solar
- Cogeneration
- Non-nuclear utilities
- Geothermal
- Pollution Control
- Conservation / Insulation
- Recycling
- Resource Recovery

NEW ALTERNATIVES FUND is a Mutual Fund that gives you the  
choice to concentrate your investment in companies that capitalize on  
energy cost consciousness and environmental awareness.

### NEW ALTERNATIVES FUND

A Mutual Fund concentrating in

Alternate Energy, Solar Energy and Conservation Investments

For more complete information, including charges and expenses,  
send for our prospectus. Read it carefully before you invest.



- See our track record
- Examine our list of investments
- Min. investment: \$2650
- Call collect: 516-466-0808 or send coupon

NEW ALTERNATIVES FUND, Inc.  
295 Northern Blvd., Great Neck, NY 11021  
Please send me a Prospectus and Fund package.

Garbage 5/91

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_





## THE BUMPY ROAD TO

# Tire Recycling

**S**OMETIME AROUND 3500 B.C., MAN INVENTED THE WHEEL WITHOUT TAKING INTO ACCOUNT ITS DISPOSAL. NO PROBLEM, FOR MOST OF OUR HISTORY. THINGS CHANGED WHEN THE MASS PRODUCTION OF RUBBER TIRES CAME ON THE SCENE IN THE EARLY 1900s, ALONG WITH AUTOMOBILES.

Massive, durable and elastic, the scrap tires of today never seem to go away — to the point where three billion (that's billion-with-a-b) of them have accumulated in legal piles and illegal dumps across the nation. About two million of them are on Mr. and Mrs. Havenhill's rural property near Denton in north Texas, left by a renter they didn't monitor so well.

"We have a rubber albatross around our necks," says the spry Mrs. Havenhill, a retired librarian whose recommended reading list included *God's Own Junkyard*, a 1965 book on trash and landscape blight. Peeking out from the tall grass along the country lane to the Havenhill place, and mired along the banks of Hickory Creek downstream, the two million tires sprawl across acres of floodplain hidden behind brambles, barbed-wire fences, and milkweed riotously overgrown. But it's mid winter, and I can see the flash of a whitewall.

Past the fence, immense levies rise between the tires and the creek, and a moat has been carved to prevent the horror of a tire fire from spreading to the adjoining cattle farm. Dozens of

tire mounds reach to the tops of 50-year-old oaks. Rains have formed a maze of deep, brackish, litter-laced ponds stitched together by beaver dams and the trails of raccoons. Says Mrs. Havenhill, the understated prairie schoolmarm, "It's not pretty."

How did this happen? The Havenhills had a rent-to-buy agreement with the fellow and didn't think much about him or the property. Then one month, the check didn't come, and they discovered that he had run a profitable and illegal tire-disposal business on the side. The word disposal is a euphemism. Being both a fire hazard (tires are a petrochemical product) and a breeding haven for mosquitoes (they hold stagnant rainwater), the tires can't stay where they are. The Havenhills are responsible for legally disposing of them, at a current cost of about \$1 per tire. It's money they don't have.

So the Havenhills wait for their one hope: that markets for scrap tires and products made from them will improve to the point where they could at least give theirs away. Meanwhile, they keep the fire department's number close to the phone and trust that the creek won't rise over the levies.

### TIRES KEEP ROLLING ALONG

United States drivers discard 234 million tires each year. Less than 15 percent are incinerated or, to a lesser extent, recycled. Four percent are shipped to other countries to meet much the same fate. The scrap-tire total would be even larger except that 44.5 million tires annually are divert-

ed to become retreads, or are picked from discards by eagle-eyed entrepreneurs who see a few more miles of road life. That leaves about 193 million tires, or about one percent of the entire waste stream, sitting around.

**W**hy so many tossed-off tires, an average of one per person each year? We Americans may love our cars, own millions of them, and pour billions into them. But their tires we treat with disdain, getting an average of 40,000 miles when good maintenance practices could expand that to 80,000 or more. (See page 37.) We can be cavalier because the relatively low price of crude oil, along with domestic overproduction, makes tires cheap. Competition from imports further drives prices down, making the cost of an import tire often lower than a comparable retread. The popularity of the steel-belted radial, which is more difficult to recap, further put the passenger-car retread market in a 20-year decline, increasing the scrap-tire total.

It's not just the number of tires that's the problem; it's also the nature of the beast. Those characteristics that give us a smooth ride for thousands of miles — density, durability, elasticity — cause the disposal problem. If tires are buried in landfills without first being chopped into pieces, the hollow shape fills with decomposition gases. Vibrations of bulldozers make these buoyant disks unstable; dawn shifts at landfills have reported tires risen to the surface like mushrooms after a rain.

The errant tires leave behind "worm holes," impairing a landfill's

BY AMY MARTIN

# 6 in America

stable, carefully layered composition. And then, sometimes, a landfill tire goes rogue. If set at a steep angle and under pressure, squeezed by heavy equipment and tons of compacted landfill, tires have been known to shoot out with such force as to overturn machinery, sometimes seriously injuring drivers.

What are landfill operators to do? Ban the slippery suckers, that's what. Starting with Minnesota in 1985, more than 30 states now regulate tire disposal in one way or another. Some ban whole tires. Other states simply slap a fee on all tire disposals. "Cradle to grave" tire-manifest systems that track tire sales put the responsibility on tire generators and sellers to guarantee safe disposal of their product.

The regulations have, however, created a new problem — illegal tire dumping. Regulations meant extra costs for tire-related businesses, which in turn led to a booming business for illegal "tire jockeys" like the guy at the Havenhills' farm. To discourage illegal dumping, several states are experimenting with "amnesty days" for scrap tires.

## ★ A MONETROUS FIRE HAZARD

If tires in landfills cause problems, their group behavior is worse. The hollow shape collects rainwater, attracting animals and mating mosquitoes. One Texas Department of Health inspector yarned that as the day warms on a Southern summer morning, clouds of the bloodsuckers can be seen rising from illegal dumps. It's close to the truth. Complaints of rampant bug breeding are often what tips off health inspectors.

Even when densely piled, tires

hold air, supplying enough oxygen to get a really good fire started and keep it going, turning any collected water instantly into steam. And what fuel to feed a fire with: The petrochemical contents of the average passenger tire equals about two and a half gallons of oil, with the energy potential of 15,000 Btu per pound, more than coal. Only about a third of each tire's oil is consumed in a fire, leaving behind the rest to seep into water supplies and aquifers.

The rank smell of unregulated burning tires can be attributed to sulphur dioxides; odorless but as polluting is nitrogen oxide, which comes down as acid rain. The carbon black used in the vulcanization of rubber for tires is the source of most of the dark particulates. Rounding out the fumes are benzene, whose effect ranges from severe headaches to cancer, and toluene, a liver- and kidney-damaging carcinogen.

Some spectacular tire fires have included the one in Winchester, Virginia, that lasted eight months, and a short (17-day) but devastating inferno in Ontario, Canada, which released more oil than was lost in the

Valdez spill. What remains after a tire fire is a toxic stew of waste oil, synthetic fibers, and metal wire, mixed with a variety of fire-fighting chemicals.





# Even in these recycling times, retreads haven't found great popularity with the driving public.

## **END MARKETS: THE REAL SOLUTION**

If somebody were out there *paying* for retired tires, as they're paying for discarded aluminum cans, the road to recycling wouldn't be littered with scrap tires. But with three billion backlogged, any company that makes products from scrap tires already has a constant oversupply of industrial feedstock. At the root, it's the same problem that plagues many recycling efforts: not enough demand for products made from recycled material.

**O**f the annual yield of trashed tires, according to the National Solid Wastes Management Association (NSWMA), five million, or two percent, are returned to the road as asphalt rubber pavement, a use that fortunately shows healthy growth. (See "Eco-Highways" on page 34.) Another promising but highly debated approach, incineration, takes 21 million, or nine percent; that percent will jump if the current vogue continues of using them as fuel for industrial boilers. Note that the heralded plethora of products that manufacturers have created from recycled rubber — mats, hoses, construction material, marine equipment — has used only five million tires, or two percent annually.

That leaves 193 million tires, 82 percent of them, to be landfilled, stockpiled, or illegally dumped each year. The latest approach to tire disposal is much like conventional integrated waste-management wisdom: reuse, recycle, incinerate — then landfill the rest. How to deal with the landfilled portion has provoked spirited tire-turf battles among rubber- and tire-trade associations and their members.

The Rubber Manufacturers Association's new Scrap Tire Management

Council is an attempt to mediate the fight. According to its wry leader Michael Blumenthal, "Our goal is to reduce the number of tires going to the landfill or to unmanaged stockpiles by 50 percent over the next five years. We do not support the landfilling of whole tires.... We think [illegal tire jockeys] should be apprehended .. and flogged."

Reducing the scrap-tire flow is a vital first step in an integrated approach. Fortunately, the tire industry has always reused their wares: ten million each year are used again as tires, and 34.5 million become retreads.

## **REUSE: RETREADING THE MILES**

Somewhere along the road (literally), the myth arose that those black strips of peeled-off rubber were the exclusive product of retread tires. The myth forged their undeserved reputation for inferiority. Actually, those black marks come from both retreads and "virgin" tires, and the reason is the same for either: neglect. Improper inflation, imbalanced counterweights, and minor but unrepaired road damage all cause uneven wear that renders tire casings unsuitable for

retreading. The offhand manner with which most consumers treat tires means that about 90 percent of scrap passenger tires considered for retreading are rejected.

**T**he bulk of the annual 34.5 million retread production (22 million) is destined for transport other than cars. Most likely, the tire for the landing and taxi gear on the last airplane you flew on was a retread. Trucks and off-road vehicles, such as bulldozers and tractors, take the rest. Some trade organizations such as the Tire Retread Information Bureau insist that, unlike passenger tires, truck tires are designed to be retread. Agreeing, Goodyear has an ad with a message reminiscent of that of the lonely Maytag repairman, stating that their trucks tires are so retreadable, "we could kick ourselves."

Because of manufacturing quality, tires that do survive driver abuse to become retread contenders — called casings by the retread industry — can be retread several times. But as domestic tire manufacturers developed better tires, they also designed ones that were more difficult to retread. "Because it's a more complicated manufacturing process to make the

original," explains Tony Hylton of the National Tire Dealers and Retreaders Association (NTDRA), "to retread it you'll need to use the same complex technology." An expensive, industry-wide changeover of equipment was required to deal with the design, and many retreaders simply stopped doing business. Before radials, 60 percent of tires were retread; now it's around 20 percent.

The telling blow to passenger retreads wasn't just tire style, but also buying habits. Even in these recycling times, retreads haven't found great popularity with the driving pub-

## **MADE OF RUBBER**

### **SLIP-PROOF TREADS:**

Rubbermaid uses crumb rubber from scrap tires to make the stair treads on their products.

### **RUBBER TIES:**

Spiff up your recycled duds with rubber ties designed by Denny La Shier. The bow-tie model comes in solid black for \$11.50. Adding white walls or raised letters ups the cost to \$12.50. Standard neckties are \$13.50 in black and

\$14.50 for decorated. Call (413) 744-4349 to order.

### **TREE RING:**

Don't trim around the base of trees and risk damaging the bark, especially with young saplings. "Tring" it instead with base protectors made from recycled tires. Standard sizes from 13 to 15 inches fit trees 10 inches in diameter and up. Tractor tires are recycled into Trings for larger trees. Prices are \$10 to \$12; custom orders available. Call (800) 562-8713 to order.

lic. According to *Modern Tire Dealer Facts Directory 1991*, only 5.8 percent of passenger-tire sales were retreads. In Europe, that percent is more like 10 to 15%.

Retreads have a virtue most recycled products don't have: lower cost, from a third as much for a passenger tire to a quarter the price for industrial tires, with little to no loss in quality. If the general public feels it can afford to find retreads inferior, fleets find them a necessity. "The popularity of retread truck and industrial tires," says Hylton, "is because of the high price of radial truck tires. They have to be retreadable at least once or twice."

In these oil-sensitive times, retreads have another trait that may be their marketing coup: Retreading conserves about 75 percent of the oil used in manufacturing a new tire, upwards of 20 gallons in a truck tire. According to NTDRA, the 38 million retreads sold in 1989 saved 400 million gallons of oil.

## ★ RECYCLING: NOT A TIRE ANYMORE

At the immense 950-acre McCommas Bluff Landfill in Dallas, Texas, one tire every seven seconds is tossed onto a conveyor belt, spraying muddy water as it lands. Scrap tires are rarely clean and, stored out in the elements, never dry. Chugging up the conveyor belt, they topple over into a hopper containing super-sharp and precision-tooled shredding blades. Tumbling down another conveyor belt come strips roughly two inches wide and eight inches long that spread across acres like an artificial lava flow. A bulldozer pulls load after load from a tire pile rising 30 feet and stretching 100 yards — 350,000 tires. "It's a slow day," says field operations manager James Hallman, his crisp business suit and clean white car contrasting with the mudfest around him. "This is an eight-month backlog we're working on. Usually we can barely keep up with new deliveries." As the bulldozer revved up to take another bite out of the pile, a trailer full of scrap tires could be seen pulling up to the landfill gate. The backlog would have to wait again.

The average passenger radial by weight is 50 percent pure rubber polymer, nine and a half percent steel bead wire, and five percent synthetic fibers; truck and industrial tires have a greater percentage of



**"Politically and functionally correct" according to the company, these bags were inner tubes. (Used Rubber USA; (415) 626-7855)**

rubber. The remainder consists of chemicals used to vulcanize and strengthen tire rubber, including sulphur, carbon black, anti-oxidants, and a bundle of trace elements such as zinc oxide and aromatic oils (for which we should be grateful).

With few exceptions, an intact scrap tire is useless to manufacturers of recycled-rubber products (which eat up five million scrap tires a year) and energy-generating incinerators (which utilize over four times that much, at 21 million annually). These operations need raw resources or industrial feedstock derived by reducing scrap tires to their basic components. To separate and retrieve those substances, one way or another the tires have to be first cut into manageable pieces. This has led to a burgeoning new business of tire-mangling equipment, all of it expensive to buy and upkeep; those blades for McCommas Bluff's medium-size shredder must be replaced every two months to the tune of \$8,000. The power to run equipment is not cheap either.

Wheel poppers, de-rimmers, and crushers first remove sealed and pressurized rubber tires from their metal rims — dangerous, and an impressive show to see. Industrial shears, slicers, and cutters whack tires into pieces of all sizes. Shredders grind out crumb rubber, ranging from pulverized granules to the industry standard of two-inch cubes to irregular strips less than

a foot long, allowing the metal and fibers to be sorted out. Waste Management, Inc. has large mobile shredders cruising several states including Colorado, Florida, Minnesota, Pennsylvania, and Wisconsin, chewing up legal and illegal scrap-tire dumps at the rate of 1,000 tires an hour. Some of the tire shreds are used at WMI facilities as road base, construction fill, and landfill cover.

In Choctaw, Oklahoma, Safe Tire Disposal designed and built a fully automated system that can shred over 1,500 tires an hour, up to 10,000 a day, a cool two and a half million a year. Off to a racing start — a clawlike grabber moves scrap tires into the system, 25% faster than by usual bulldozer methods — tires move automatically through one shredder after another and finally through a circular sorter, until crumb rubber in uniform two-inch squares is produced.

Now no longer recognizable as tires, nor nearly such a fire hazard — chipped tires lay too densely to provide air to fuel the flames — the raw goods are ready to be incinerated or turned into anything from highways to hockey pucks. The rubber is essentially as good as new. But with millions of shredded tires warehoused at his Oklahoma sites waiting for a buyer, Safe Tire plant manager Gene Embry drawled sarcastically, "Hockey pucks is right!"



# Marketing coup: Retreading conserves about 75 percent of the oil used in manufacturing a new tire.

## Will recycling top 2%?

Fun though they are, tree swings and mower deflectors, rubber ties and sandals with tire-tread soles have limited consumer markets. Lately, manufacturers have located near-large quantities of tires to churn out items for industry. The Tire Pond company in North Haven, Connecticut, is next to an old brick-clay quarry that's now a 35-acre lake, home to 14 million tires with room for millions more; the company sells some to manufacturers, others for reuse, and stores the rest or sends them to be recycled into rubber mats by workers at the local Easter Seals-Goodwill Industries Rehabilitation Center. (Tires are practically benign, if not completely inert, under water. The Tire Pond lake has been tested yearly since 1977 for over 150 chemicals, with only minute changes in the water detected.)

In response to Oklahoma's new tire-disposal laws, among the toughest in the nation, Environmental Recycling set up shop in Eufala, Oklahoma, 60 miles from Safe Tire's mountain of crumb rubber, to make 100-percent recycled rubber mats and lumberlike posts.

Using crumb rubber, according to *Scrap Tires News'* special report "Scrap Tires in the '90s," plants are churning out industry decks and chic home-flooring tiles; roll-out mats for gymnasts and mats to wipe your feet on at the door. An elastic webbing produced with crumb rubber can be made into a fine net to anchor carpet fibers, or a thick mesh for hillside erosion control, or an epic-strength flexible gasket for use between floors of skyscrapers in earthquake zones.

The rubber chips themselves are used in

playgrounds as a safer substitute for gravel, to replace rock in gravel roads and septic-tank systems, and as mulch in places where appearance isn't a priority. Heat crumb rubber under compression, and you get resilient building blocks, from brick-size to one-ton bales. Other scrap tires go on the road as trailer bumpers, mud flaps for semi-trucks, and liners in pickup beds.

**C**ashing in on tires' durability and shape, inventor/businessman Jerry Goldberg came upon the keen idea of linking scrap tires together with thick, high-tensile cable to make Terramat. Prop it up vertically in a blasting area and you've got a safety shield that catches debris but lets air gusts through. Toss it in water and it's permanent fill; cable it to the shoreline for erosion control. Lay it on the ground and you've got insta-road for construction areas and accessing natural-disaster sites; fill it with gravel and the road is semi-permanent.

There's more. Stack up whole tires, fill them full of dirt, slap some adobe on the exposed treads, put a roof on top and you've got one heck of a well-insulated abode. Actor Dennis

Weaver's so-called Michelin Mansion in Ridgway, Colorado, used 3,000 tires. Near Taos, New Mexico, 50 houses using about 650 tires apiece are nestled into the Rocky Mountain foothills.

Aside from durability and bounce, rubber's other endearing trait is its imperviousness to water. Tie tires together and it's anchors away for floating breakwaters and artificial reefs; rubber in sea water becomes completely encrusted by mollusks and other filter-feeding crustaceans within a few weeks. Extra-large tires measuring six to eight feet in diameter, a size many shredders can't handle, are being cut in half to use as water troughs for farm animals. Push melted rubber through a tubular extruder for sub-surface irrigation systems and other hose products.

## Compost to toxic sponge.

Resistant as they are to water, scrap tires soak up some other liquids. Dr. Wilhem Reindle of the University of Minnesota is experimenting with crumb rubber to absorb oil spills; oil can be pressed out and the rubber used again like a sponge. As reported in "Scrap Tires in the '90s," Dr. Robert

## SCRAP TIRE INFOMANIA

**F**or the ultimate overview on what to do with scrap tires, read the trade monthly *Scrap Tire News*, with manufacturing news, incineration advances, shredding equipment, scrap-tire legislation reports, and more; a year's subscription is business-priced at \$118. For tackling the scrap-tire crisis on a more individual basis, try STN's book *ReTired*, with over 50 home projects including making landscaping materials, tree swings, and playground equipment.

The \$12.95 price includes a special sabre saw blade designed to cut tires with home workshop tools.

Both publications are available from STN at P.O. Box 714, Suffield, CT 06078, or call (203) 668-5422.

**American Retreaders Association**  
P.O. Box 17203  
Louisville, KY 40203  
(800) 426-8835

**National Tire Dealers and Retreaders Association & NTDR News**

1250 I St., NW, Suite 410  
Washington, DC 20005  
(202) 789-2300  
(800) 87-NTDRA

**Rubber Manufacturers Association Scrap Tire Management Council**  
Washington, DC  
(202) 682-4800

**Tire Retread Information Bureau**  
26555 Carmel Rancho  
Boulevard, Suite 3,  
Dept. 990  
Carmel, CA 93923  
(202) 625-3247

## HISTORY OF RUBBER & TIRES

While cruising the Caribbean in the 1490s, Christopher Columbus saw Haitian natives playing with a bouncing ball they'd made from oozing sap. By 1615, South and Central American Indians had learned to make cuts in the bark of *Hevea* and other tropical trees to extract quantities of the milky, white latex. It was brushed on cloaks to create the original rainwear, and poured into crude molds to make rubber bottles and galoshes. But still no rubber wheels.

Synder of Tire Technology Inc. in Michigan, a former research director for Uniroyal (now Uniroyal-Goodrich), is researching crumb rubber as an absorbent for hazardous or toxic waste, which can soak up to its own weight in hydrocarbon liquids and gases, polychlorinated biphenyls (PCBs), printer's ink, hydrocarbon sludges, and other oily wastes.

Then there's always turning scrap tires into compost. This new field, still in the experimental stages at the U.S. Dept. of Agriculture labs in Maryland and New Hampshire, involves replacing wood chips with rubber bits in the composting of municipal sewage sludge. Though the composted end product would undoubtedly withstand a lot of foot traffic, it's aesthetically unpleasant stuff, usually banished to low-pedestrian areas such as highway night-of-ways. The composting process could, supporters say, quickly use up the backlog of tires. This begs the question of what's to happen to all those wood chips, also unwanted at landfills.

On a more conventional note, the U.S. Dept. of Energy is conducting experiments into modifying scrap rubber so that plastic can be bonded to it. When mixed with polyurethane, the main plastic for forklift tires, it yields a substance that doesn't slip, even on wet, polished concrete. With just 10,000 Btu per pound needed for production of modified rubber, compared to 80,000 Btu for virgin polyurethane, a lot of energy could be saved. A drawback: the hybrid end result is a problem to recycle.



### INCINERATION: A SHORT-TERM NECESSITY?

Each tire has energy potential. It takes 20 gallons of oil to make the synthetic rubber in a truck tire, about half of the tire's total rubber content. An average-size passenger tire contains about 15,000 Btu per pound; compare that to

coal's typical 10,000 Btu per pound. But rubber's energy value doesn't come without costs: scrap tires are bulky and costly to transport even when shredded, and burning petrochemical-based material as fuel means expensive pollution controls.

Put through a thermal extraction process called pyrolysis, a passenger tire will yield, in addition to carbon black, one gallon of burner-quality oil and 450 cubic feet of propane gas, easily enough to heat a home for a day. The problem is profit. With its extensive pollution-prevention and safety equipment, pyrolysis will be a money loser until oil prices top \$50 a barrel. Pollution by sulphur dioxides released during the process is another nagging issue.

More cost-effective, for now, than pyrolysis is simply burning tires for steam and gases to spin electrical turbines. The Oxford Energy Company's first plant in Westley, California, burns four and a half million tires yearly to generate 14 megawatts of electricity for some 15,000 homes. Located near the largest scrap-tire dump in the world (42 million tires or more), saving money on transport, the facility uses an unusual, money-saving approach, feeding tires whole into 2000-degree-Fahrenheit boilers.

For 200 years, rubber's potential remained untapped. Well, not untapped, but unrealized. Exasperating to manipulate, rubber needed solvents to make it more workable, and turpentine and ether didn't come cheap in those days.

Around 1820, Scottish chemist Charles Macintosh thought of using an industry standard, coal-tar naphtha, as a solvent for rubber. What came out of Macintosh's experiments was a rubber that would combine effectively with fabric, that's why some raincoats are called "mackintoshes." His colleague Thomas Hancock came upon ways to heat-meld rubber for manufacture. Now, tires were a possibility.

Still, the wonder stuff was a mess: it expanded when hot, contracted when cold, and was too tacky for most purposes except the one from which it got its common name: erasing pencil marks. Even worse, it smelled really bad, and disintegrated too quickly. Charles Goodyear changed all that in 1839 with the invention of vulcanization — blending rubber, lead, and sulphur with heat. This rubber was durable and consistent, if still a bit odorous, and perfect for tires.

The idea for an air-filled tire was patented as early as 1845, but went nowhere, beat out by solid-rubber tires. In 1888 an Irish chap named John Boyd Dunlop, a veterinary surgeon by trade, patented a design for pneumatic bicycle tires — inner tubes filled with compressed air and then set in a protective rubber casing — in his search for a gentler ride. Dunlop was no casual cyclist, and soon after his patent no longer a vet.

Bicycling beat walking to work for late-19th-century commuters,

Using technology purchased from the West

German firm of Gummi-Mayer, to which Oxford has the exclusive North American rights, the boiler's temperature is computer monitored to achieve the cleanest burn; extensive scrubbing systems control airborne pollution and odors. Melted-away steel is retrieved for recycling, zinc from the fly ash is recovered for re-smelting, and the lime slurry used in scrubbing is recycled for its gypsum (calcium sulfate) content. Passing even California's strict air-quality standards, Oxford plans future plants for Lackawanna, New York, and Sterling, Connecticut.

But according to Michael Kennedy, manager of Tire and Fuel programs for

CONT. ON P.35



Waste Management-North America, most of the 21 million tires burned are used in cement kilns and pulp and paper industry boilers as tire-derived fuel (TDF), another way of saying crumb rubber destined for incineration.

Crumb rubber is considered a lump fuel, and most boilers can only use a minority percentage of lump fuel. A few electricity generators, including the Illinois Power Company, are also experimenting with TDF. Sometimes the tire-to-energy cycle almost fits the definition of closed-loop: Scrap tires are burned for fuel at Firestone's tire-production plants and at a major retread factory in the Midwest.

Proponents of TDF stress the lower levels of sulphur dioxides and nitrogen oxides released by burning scrap tires compared to coal, and the necessity of trimming the backlog of three billion scrap tires.

Opponents such as the National Toxics Campaign maintain that the massive boilers cannot be monitored properly to control pollution, that blending fuels can lead to new and possibly hazardous compounds being formed during burning, and that unscrupulous industries could conceivably hide toxic wastes by soaking scrap tires in them prior to incineration.

Michael Blumenthal of RMA's Scrap Tire Management Council concludes, "Incineration is not the ultimate answer; it's an interim answer. As other markets for scrap tires increase, the economics of incineration won't hold out."

## ★ THE FUTURE: LOOKING FOR BLACK GOLD

The future of scrap-tire recycling hinges on one thing: the price of oil. The low cost of crude drives intense competition among virgin-rubber producers, keeping prices down and

**Tirec Systems promises 100% recycling of scrap tires. After granulation, steel particles and polyester fiber are separated from the rubber, and sold as raw materials.**

recycled rubber products out of the picture. But with three billion-with-a-b tires and counting, a more pro-active approach seems needed. States including Florida and New York require the use of asphalt rubber on public roads. Retreads are picking up in popularity, especially with the government. The Environmental Protection Agency finalized guidelines requiring the General Services Administration to approve retreads for inclusion on the federal government's Qualified Products List, opening up a market for millions of casings, especially in the passenger-car division for government employee fleets (meaning big savings for taxpayers). And most states that imposed tire-disposal fees are setting aside some money to research tire recycling.

If there weren't so many darn tires in the first place, the disposal problem wouldn't be as immense. Extending tire road life, buying long-lasting tire brands, using mass transportation, are all actions each tire consumer can take. But the number of tires annually bought — and discarded — won't be substantially reduced as long as we're a car-dependent society.

*Amy Martin, a Dallas-based science and environmental writer, has a column entitled "Talking Texas Trash," syndicated throughout the state.*



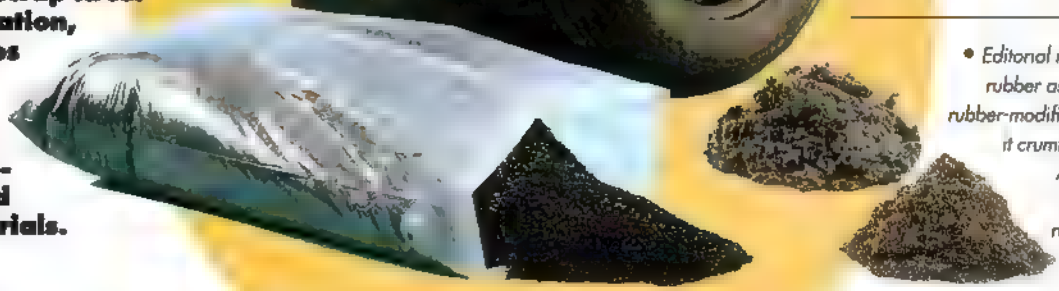
ECO-HIGHWAYS:

# Where the Rubber Meets the Road

The next great black hope on the horizon is asphalt rubber (AR)\* paving, which consumes five million scrap tires a year. Up to 16,000 tires find their karma in every mile of a three-inch-deep, two-lane paving. In rubber-modified asphalt concrete, sometimes called dry-process AR, crumb rubber replaces some of the stone, sand, or aggregate used in conventional paving mixtures. The coarse material is mixed at the paving site with hot asphalt, a dark and tacky substance which, like rubber, can be both naturally derived or a petroleum by-product. Laid out as pavement, AR paving hardens as it cools. The number of tires used per mile depends on the pavement thickness. Off-road, AR is used for running tracks and airport runways.

AR's virtues are easy to extoll. It's more elastic than conventional asphalt so it cracks less and lasts up to three times longer. The

• Editorial note: NSWMA calls it rubber asphalt; NTDRA calls it rubber-modified asphalt, FHA calls it crumb-rubber asphalt. The Asphalt Rubber Trade Group calls it asphalt rubber, and so will we.



and it was cheaper than taking a street car. Machinery driven by steam and electric power increased demand for rubber, as did the rise of automobiles in the early 1900s. French rubber manufacturer Michelin & Cie transferred pneumatic technology to cars' bigger wheels. Switching farm tractors to rubber wheels (from steel) further upped the ante. Sales took off; by the 1960s, when radials took over and retreading plummeted, the scrap-tire situation was becoming a crisis.

**British territories** in Ceylon (now Sri Lanka) and Southeast Asia became the scene for a huge rubber-plantation industry, using seeds of the *Hevea brasiliensis* species collected in South America in the mid 1800s. American industry ran on rubber collected drop by drop across the globe and imported, often from unfriendly and unstable countries. (Sound familiar?) When Japan conquered Southeast Asia in the early '40s, the United States' major rubber source was cut off.

**In the meantime**, Germany and the Soviet Union had figured out how to make synthetic rubber from petrochemicals. American industry responded with their own synthetic version within a year. Like pre-vulcanized natural rubber, synthetic rubber had its ups and downs, but by the 1950s the two were about equal in popularity. A variety of synthetic rubbers was developed, each with its own peculiar qualities: Silicone rubber withstands high temperatures, acrylonitrile resists oil, and butyl rubber is less affected by air.

**In many ways**, natural rubber has better elasticity, resilience, and tack than synthetic. Because of its tendency not to build up temperatures, natural rubber is essential where overheating could cause tire failure.

Passenger tires are 55 percent synthetic and 45 percent natural.

Tire technology developed through companies whose names are a whole rubber's hit parade, including Dunlop, Goodyear, and Michelin. By the 1950s, tubeless puncture-sealing tires of new ball industrial fabrics and rubber bonded to a metal rim were standard. From there the modern car tire was game with little margin for error.

Even so, why isn't this stuff on every highway? "Naturally there's resistance to anything new that requires learning something new," says Gary L. Cooper of the Asphalt Rubber Producers Group (ARPG), alluding to the aforementioned AR peccadillos. Plus, he adds, "It's an improved product, not a miracle product. The place it's used has to be engineered as well as the product." In other words, it won't make a bad road better, as was once claimed. Although AR for roads has been bouncing around since the early 1900s, it didn't hit its stride until the '60s. At that time, according to Cooper, original promoter/developers of AR were a little "overly enthusiastic about the product," oversold its virtues, minimized its drawbacks, and didn't adequately train paving contractors in AR's more complex application. That hype gave AR a widespread (and deserved) initial reputation for inferiority.

The role of the ARPG over the past 20 years, according to Cooper, has been to simultaneously develop efficient, cost-effective technology and equipment for AR production and application; educate appliers of conventional asphalt in AR technique;

**The development** of plastic siphoned off many of rubber's previous markets.

Now rubber's main uses are tires — over half of all rubber sold — and shoes.

— A.M.

rehabilitate AR's shady reputation; and take on the vigorous and influential conventional-asphalt lobby. The AR drawback most touted by competitors is its expense, 30 to 50 percent more costly to prepare and apply than conventional asphalt. Cooper points out that "those figures are based on municipalities laying AR in small sections of roads as experiments, a situation where any cost would be higher." He cites a California highway-paving project that determined that, because of its added bounce, one inch of AR could replace two inches of conventional asphalt, bringing costs to a rough equal.

The NTDR, ARA, Rubber Manufacturers Association, Tread

surface is highly textured, tending to furl away rather than puddle water, making AR safer to drive on than concrete, glassphalt, or conventional asphalt. AR can be mixed in warmer outside temperatures than conventional asphalt, extending the season and weather conditions under which roads can be built and repaired. It's also 50 to 80 percent quieter to drive on, reducing the costs of noise-abatement structures along highways in populated areas.

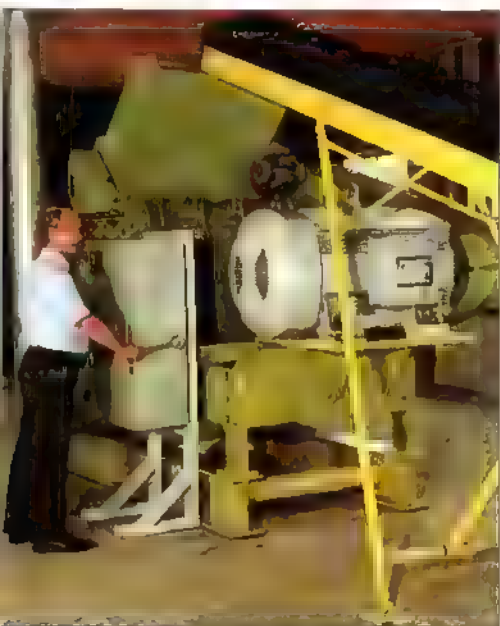
The northern states experimenting with it — Massachusetts, New Jersey, New York, Minnesota, and Washington — are hearing raves from drivers for its ice-resisting abilities, especially on bridges. That's an unexpected plus for a product first developed in Arizona, and a bonus for the environment because AR won't need as much rock salt for de-icing. For the past several years, asphalt rubber has been used on Interstate 80 through the legendary 7000-foot-high Donner Pass in the Sierra Nevada of California.

**M**ore roads are being repaired than new roads being constructed, so in greater demand than plain AR is asphalt-rubber binder, which has a solid track record as a cure for cracking in conventional asphalt pavement caused by fatigue, weather — everything but earthquakes. Since 1983, the Texas Highway Department has used this mix as a stress-absorbing membrane and interlayer in 3,700 lane miles of conventional paving (at the rate of 1,000 tires per mile). While applying conventional asphalt pavement is a complicated-enough process, applying hot conventional asphalt binder is a cross between science and art, an exceedingly complex sequence of chemical reactions involving viscosity, elasticity, and granular structure. Now add the crumb-rubber variable and you've got



Rubber Manufacturers' Group, and the Private Brand Tire Group drafted a joint action encouraging the Federal Highway Administration to issue standards for asphalt-rubber pavement to foster its marketability. The FHA concurred. Douglas Bernard, chief of FHA's Demonstration Projects Division, testified before a U.S. Senate Subcommittee on Energy Regulation and Conservation that if AR could "demonstrate cost-effective performance, then crumb-rubber asphalt could become a significant alternative use for waste tires."

Asphalt rubber isn't the only way for highways to help the environment. Highway departments are immense



COURTESY TRISC

### Scrap tires unsuitable for retreading are granulated, and different parts separated.

purchasing entities and can be a pivotal player in recycled-material markets. The Texas Department of Highways is the largest builder of roads in the United States, if not the world. The Lone Star chapter of the Sierra Club has asked that the department create an environmental advisory committee to explore highway-related eco-matters.

**Plastic:** Working with Du Pont Company and Waste Management, Inc., the state of Illinois is identifying highway construction and maintenance projects that could use recycled plastic. One of the first products, manufactured by WLI Industries, is the SafetyCade three-

piece collapsible highway barricade. Made from recycled HDPE, the plastic is refined at the Chicago facility of the Plastic Recycling Alliance, a joint venture of WMI and Du Pont.

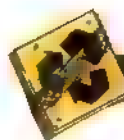
Also under consideration is the use of plastic lumber instead of wooden posts to erect barriers, and instead of concrete for bollards. Plastic lumber is termite- and waterproof, making it particularly good for remote and frequently flooded areas; it's lighter in weight, saving on shipping costs and the manpower need to install it; and it's tinted so it never needs painting and graffiti washes off.

**Mulch:** Mulching highway right-of-way plantings is often more than just beautification; plantings prevent erosion. In these times of water conservation, the California Department of Transportation uses mulches from wood chips, but someday the chips will be composted with municipal solid waste. A few places use a mulch of chipped tires. Organic material in mulches is absorbed into the soil so that it retains water much more effectively.

**Pavings:** Highway paving made from concrete can be recycled simply by crushing it back into small rubble and mixing it again with liquid. The problem, as with scrap-tire crumb rubber, is removing the metal. Concrete from the double-deck Embarcadero bridge, a victim of California's last major earthquake, which is finally being demolished, will be crushed and reused in the construction of the new bridge.

Conventional asphalt paving can also be recycled, but the technology has so far lagged. Cyclean Inc. is working with the cities of Austin, Texas, and Los Angeles, and with the Army Corp of Engineers at Army airfields, to recycle asphalt. Using microwave energy, old asphalt is scraped up, rejuvenated, and laid back down in one operation. The machinery surpasses California clean-air standards. Carl Hutchinson of Cyclean estimates that 100 million tons of asphalt is landfilled each year. Cyclean is contracted to provide Los Angeles with 120,000 tons of recycled asphalt annually.

As for asphalt-rubber paving, which is just 20 years into its existence, none of it has degraded enough to need to be recycled. —A.M.



## DOING YOUR PART:

# How to Make Tires Last

**BUY RETREADS:** In 1989, car and truck retreads saved 400 million gallons of oil. Retail establishments that sell recaps usually cater to the truck and trailer crowd, but passenger retreads are available. Look for these establishments in the Yellow Pages under headings such as "tires — used," or tire recapping, retreading, and repairing.

Many of these places will accept your old tires for recapping; sometimes you can even get the originals back retreaded. To make sure your tires can be recap candidates, keep them in good shape and turn them in before the tread gets down to one-sixteenth of an inch. Though difficult to retread, radials make superior recaps because the tire withstands general wear better than bias.

For a free copy of the "Directory of Scrap Tire Processors," write to the Rubber Manufacturers Association, 1400 K St., NW, Washington, DC 20005 or call (202) 682-4800. For an overview, "Scrap Tires ... Understanding the Challenge," write to the Public Information Dept., Goodyear Tire & Rubber, 1144 E. Market St., Akron, OH 44316 or call (216) 796-2121.

Most major tire retail chains including Goodyear, Michelin, and Uniroyal-Goodrich sell retreads, but only for trucks and industrial vehicles. Michelin issues credits to buyers of their new commercial tires, which can be applied toward the cost of retreading Michelin casings. *Scrap Tire News* gave the company a "High Performance Award" for the program last year.

Sears catalog offers Achievor® remanufactured radial passenger-car and light-truck tires, and radial and non-radial generic retreads. Call (800) 366-3000 to order a copy of the automotive specialty catalog. Or purchase Achievors® and other retreads directly through Lakin General Corporation factory; call (800) 545-8563.

Take things one step further and request that companies and state and government departments use retreads. Most airlines and large taxi fleets run on recaps. Corporations using retreads include Federal Express and United Parcel Service.

For a free brochure on the economic and environmental benefits of retreads, send a self-addressed stamped envelope to Tire Retread Information Bureau, 26555 Carmel Rancho Boulevard, Suite 3, Dept. 990, Carmel, CA 93923.

#### **BUY LONGER-LASTING TIRES:**

Some tires live longer than others. Look for tires with higher tread-wear ratings, but remember that actual tire life depends on more than tread-wear ratings.

For a pamphlet listing the traction, temperature, and tread-wear ratings for all domestic and imported tires, call the National Highway Traffic Safety Administration's auto-safety hotline at (800) 424-9393, or write to Distribution Center M443.2, National Highway Traffic Safety Administration, 400 7th

Street, NW, Washington, DC 20590.

The Center for Auto Safety has ranked 150 popular tires; write to them at 2001 S St., NW, Suite 410, Washington, DC 20009.

#### **BUY LESS-POLLUTING TIRES:**

The harder ride you get from radials pays off in less rolling resistance, which in turns leads to greater fuel efficiency for your car and less air pollutants released

#### **SEE YOUR TIRES TO THE END:**

Whether you're buying retreads or regular, purchase only from stores that have responsible scrap-tire-disposal policies for the used tires turned in. Most states require guaranteed safe disposal of scrap tires, but sometimes those regulations apply only to larger dealers. Most of the national chains have corporate policies on legal disposal.

If somehow you do end up with worn tires you don't want — there are a few places where a trade-in on your old tires means they end up in your trunk — be aware that many residential garbage collectors won't pick them up. Resist the urge to toss them in the nearest dumpster. Call your sanitation department and ask about scrap tires; most municipal landfills and transfer stations will accept a limited number of tires from residents without charge or at a low fee. Occasionally recycling centers will as well.

**TLC FOR LONGEVITY:** Most passenger tires hit the scrap pile 40,000 miles shy of their intended lifespan of 80,000 to 100,000 miles, mostly due to driver neglect. That means we throw away twice as many tires as we need to. A well-maintained tire is also easier to retread.

If all tires were properly inflated — half on the road are under-inflated — two billion gallons of fuel could be saved a year. The suggested air pressure is embossed on each tire's sidewall; increase pressure slightly for extended highway driving. Carry a pen-sized air-pressure gauge in the glove compartment and check pressure while tires are cold.

Rotate and balance tires every 6,000 to 8,000 miles; check the sidewall to see what direction the tires should point. Use uniform and firm inflation; an under-inflated tire creates drag or rolling resistance, is less energy efficient, and leads to greater cumulative emissions. Keep your car's alignment balanced, and brakes in good shape.

Check for road damage frequently and repair promptly. Stand up for tire rights by lobbying your municipality for greater pot-hole maintenance.

For a glove-compartment-size, tire-safety and mileage kit including air-pressure gauge, tread-depth gauge, four tire-valve caps, and a hefty *Consumer Tire Guide*, send \$4 to the Tire Industry Safety Council, P.O. Box 1801, Washington, DC 20013.

Call your local Better Business Bureau and ask for *Tips on Tires*, part of the BBB's Consumer Information Series. It includes suggestions on tire rotation and alignment, purchasing and warranty tips, and an excellent guide to reading all those numbers and letters and symbols embossed on a tire's sidewall. Or write the Council of Better Business Bureaus, 1515 Wilson Blvd., Arlington, VA 22209.

Another guide, oriented toward high-performance tires, *Tire Tips* is available from Bridgestone by calling (800) TIRE-BSA.



**"Tring It" and you can mow around it, promises Port Industries, which uses waste-tire parts for its rubber tree rings.**



**A**round my home town, "dump-picker" was about the meanest name we kids could think of to call each other. Paradoxically, one of my favorite grown-ups was Carol E. Gray, a crusty gentleman with an endless supply of tall tales and a front yard that was a maze of stoves, washers, car parts, tires, old farm implements, and furniture. Mr. Gray brought all these things home from the dump, fixed them up, and sold them to people who couldn't afford to be finicky.

Like so many others, our town dump was located in a swampy area, where its leachate is proba-

ble to lease on life. If you want to be a dump picker these days, you've got to beat the garbage truck.

But then, who's hankering to be a dump picker? Let's face it: We've got a hangup about owning something that's already been owned. Even being spotted with a fistful of clothing at the Goodwill store sends a gush of blood to our cheeks. Poor people shop at Goodwill, the perception goes, and "poor" is the *last* four-letter word we want to be called.

Well, it's all in the name. Rechristen the Goodwill the "Chic Antique Boutique," and business will boom. In the same vein, wander down to the community swap meet in search of a \$4 radio, and suddenly, you don't feel like a dump-picker at all!



PHOTOS BY PAUL AIKEN

**SNATCHING DISCARDS SAVES ENERGY, RESOURCES, AND LANDFILL SPACE. AND LOTS OF MONEY.**

bly still fouling the water. Particles of its grubby smoke probably still colonize the lungs of nearby residents. If that dump isn't closed by now, it should be.

Unfortunately, as dumps like this one close, the Carol E. Grays of the world lose access to the tons and tons of perfectly good, money- and resource-saving items that their neighbors prematurely throw away. Increasingly, garbage is kept under lock and key, with no chance for a second

# DUMP PICKING FOR BEGINNERS



#### SAFETY IN NUMBERS

**P**oking through other people's discards can be a lonely sport for the individual.

"People won't look at you," says Daniel Cross, a Flagstaff, Ariz., graduate student who's found everything, from new clothing to furniture to a change jar holding \$37.92, in the dumpsters outside the Northern Arizona University dormitories. "It's as though they're afraid of you. As though you must be from a different segment of society."

For those who lack the nerve to scour sidewalks and dumpsters in broad daylight, there may be a place in your community where you'll be just another face in the crowd of environmentally aware swappers.

For instance, when the Central Vermont Planning District sponsors an old-paint drop-off day, they make room for a paint-swap table. You bring your half-gallon of interior orange. A paint expert examines it for hazardous ingredients, and directs it either to a disposal barrel or to the

**Tom and Rosemary Smith dive deep into a Virginia dumpster - and surface with garbage gold.**



# "I'M NOT USING IT ANYMORE, BUT LET'S NOT LET IT GO TO WASTE."

—Marchelle Duranleau Wolf, whose rabbit hutch came from the Freebie Corner neighbors maintain near an intersection

reuse table. There, you may score a partial can of exterior purple — just enough to paint the dog house. It's yours, free of dirty looks. Since its state-assisted pilot drop-and-swap in the fall of 1989, the District has hosted a second event, helping, in all, 1,500 gallons change hands. And it has avoided paying at least \$5,500 in disposal fees. Eight of the state's 12 solid-waste districts have followed suit; the other four have drop-and-swaps planned.

Sidewalk swaps are another place to redistribute your leftovers. The Freebie Corner in South Laguna Beach, Calif., is just such a spot. When Marchelle Duranleau Wolf and her husband moved to the neighborhood two years ago, they noticed the neat, wooden "Freebie Corner" sign that someone had added to a lamp post at an intersection. Beneath the sign, at the side of the road (there are no sidewalks), was a small collection of household and yard items. Since then, the Freebie Corner has furnished Ms. Duranleau Wolf with a rabbit hutch, and she has furnished it with a hassock. (The hassock, however, had a hard time being adopted — over the

weeks, she watched it turn up again and again.) The Corner is in the middle of the neighborhood, in view of a couple of houses. It is always neat and the participants make sure there is never too much stuff there.

"There's an unspoken [rule] that there shouldn't be a lot of stuff there," she says. And no one is ashamed to pick up goods from the Corner. "It's all in the spirit of 'I'm not using it anymore, but let's not let it go to waste. If someone else can use it — great.'"

The idea of "shopping" on the sidewalk isn't only a West Coast phenomenon. The day my pal and I rented our Brooklyn apartment, we rescued from the curb a pretty little hutch with etched-glass doors. As we prepared to leave Brooklyn recently, we put out two chairs, a burned-out TV, an old piece of broadcast-testing equipment, and a bag of clothes. All disappeared within the hour. And in cities where the sanitation department takes "big junk" only once or twice a year, swappers literally race the

garbage trucks to rescue the gems from the sidewalk.

Perhaps the most out-of-the-closet dump-picking program makes its home in Wellesley, Mass. The recycling drop-off in this small city offers far more than the standard bins for glass, paper, and steel. There is a "swap shop" board where Wellesleyites can *advertise* their unwanted couch, fertilizer, or paint. There's a book exchange. And there's also a "take it or leave it" area, where superintendent George Barry says he's seen people leave (and take) just about everything, including a kayak and small rowboat. One woman even asked if she could leave her old Volkswagen there. By sanctioning the reuse of goods, the town achieves a 28-percent recycling rate, overall, and gives dump-picking a good name. In Wellesley, being caught *taking* goods from the bustling recycling depot is nothing to blush about.

## DUMPSTER DIVING

**D**umpster diving is not for those who are vulnerable to smirks and sneers. "We've been taught that we've got to buy, consume, and throw away; buy, consume, and throw away," says Edmund B. Fitzgerald, dumpster diver. "We come to think that somebody who doesn't do that isn't a full member of society."

Mr. Fitzgerald is the editor of *NAD-DUM News* — the newsletter of the National Association of Dumpster Divers and Urban Miners. A veteran scrounger, he's gotten his share of strange looks, which are usually transformed, he says, when he pulls forth a good appliance or piece of furniture. "They realize, 'Hey! He's got something really nice! And he didn't pay anything for it!'"

With town dumps closing fast,

**Curbside pickup: In cities, divers scramble to keep ahead of garbage trucks.**



dumpsters present an excellent opportunity to salvage good stuff, according to *NADDUM News*. Each issue offers numerous success stories, as well as advice on dumpster etiquette, such as: Always ask permission before you dive into a company's dumpster. If somebody's working a claim when you arrive, wait your turn. And carry, for credibility and quick assessment of treasures, a copy of *Schroeder's Antiques Price Guide*.

Dumpster diving can be lucrative. A recent *NADDUM* story profiles a diver in Maryland, who reported scoring a stereo, cassette deck, speakers, two radios, a computer terminal, tape drive, and printer, a cable-TV converter, and a printing calculator, within the space of a month.

Another success story, from Virginia, got its start when the "Smith" family's real-estate investments collapsed, followed shortly by the washing machine. In desperation, the Smiths (through anonymity, they hope to avoid zoning-board persecution) dismantled their washer, finding a small toy lodged in the water pump. Acting on a hunch, they subsequently discovered that half the washers peo-



ple throw away have very little wrong with them. A new business was born. In five months, the family rescued 50 repairable washers and dryers from the curbside and resold them. (Since the recession set in, appliances are turning up less frequently.)

In the process, Rosemary Smith has become a dumpster junkie, to the chagrin of her daughters. The family cruises the wealthy side of town, scoring a steady stream of washers and dryers, as well as a nearly new lawn mower, a wrought-iron patio set, and an antique bed, inlaid with ebony, cedar, and cherry floral patterns. She

### The Smiths score skates and books that were destined for the dump.

chuckles, "We're the 'poor trash' of the neighborhood, but it's been really beneficial. I've made so much money off this one guy, I feel like I should write him a check." Her daughters forbid her to stop in front of classmates' homes, and her husband draws the line at opening garbage cans. But she's hooked. "It's like yard-saling," she says. "Some Sunday nights, when I can't be everywhere at once, I think, 'What am I missing? What's going to the dump?' I wish I could get one of those satellites to take pictures of every neighborhood, so we'd know where to go."

Dan Cross, the Flagstaff graduate student, echoes this sentiment. "You know you don't need anything, but there's an excitement about it," he says. "It's like people who go to antiques sales or auctions." He checks regularly on dumpsters behind the Goodwill, a grocery store, and a gen-

## CORPORATE DUMPSTER RAIDERS

**B**usinesses harbor no fine feelings about raiding a dumpster (figuratively, at least) now and then, since it has proven to be a sound financial strategy. Across the country, newsletters, swapsheets, and helpful organizations are popping up to assist businesses in using up each other's waste.

One of the most energetic of such programs was born to a strange pair of bedfellows in Iowa. One parent was the "Try Iowa" program, through which agents travel the state pressing businesses to buy their raw materials from in-state suppliers. They were hearing pleas for another kind of assistance — help us get rid of stuff. The other parent, the Iowa Waste Reduction Center, was interested in doing just that.

Now, when Try Iowa agents from three of Iowa's 16 Regional Economic Development Centers call on business owners, they make an analysis of the company rubbish heap. The type of waste products, with the annual volume, are noted. Back at the office, the staffers work the phone, calling every company that they think might have a use for things like 26,000 pounds of feed bags, 520

pounds of aluminum printing plates, or 600,000 pounds of egg shells. Every three months, a list of such goodies, garnered by the three districts and the statewide Iowa Waste Reduction Center, is sent out to 1,300 businesses.

One recent match involved a pallet rebuilder and a hydraulic nail-gun maker. The pallet rebuilder was cobbling together old pallets, and accumulating a mountain of scrap wood. To test their nail-guns, that manufacturer was buying new 2-by-4s, filling them full of nails, and sending them to the landfill. Through the waste exchange, the nail-gun maker got those scraps for free, and shot them up. The pallet rebuilder burned the wood and sold the reclaimed nails as scrap.

Another match should put those tons of eggshells to use. "I got them together with a fertilizer company," says Gary Dill, one of the state's garbage cupids. "They're setting up to land-spread the eggshells, 'cause they're 96 percent calcium chloride — lime."

If your business is ready to diversify into dump-picking, see *Resources*, following page, for a list of swap programs.



# "PEOPLE WON'T LOOK AT YOU. IT'S AS THOUGH THEY ARE AFRAID OF YOU."

—Daniel Cross, a Flagstaff, Ariz., graduate student, on the reaction of people who spot him mining his university's dumpsters.

eral store (where one day a woman saw him salvaging screwdrivers and pressed \$4 into his hand, telling him to get something to eat).

At the university, the end of the semester always finds dormitory dumpsters overflowing with furniture, clothes, books, notebooks, appliances, even full bottles of shampoo. Anticipating this bounty, Mr. Cross is torn. He's assistant-teaching now, and he worries about his students seeing him reclaim their discarded clothes and hairdryers. He says doubtfully, "I believe in what I'm doing, so I guess I've got to ignore that."

If dumpster diving sounds like your kind of shopping, prepare for a lot of tinkering. Furniture usually needs refinishing or painting. And most people don't throw out a radio, washing machine, or computer unless there's something, however minor, wrong with it. Although you'll usually need to do some troubleshooting and minor manipulation, sometimes all a cranky appliance requires is a brisk "service tap."

Also, keep your eyes peeled for tools of the trade. (A real dumpster diver would "scrounge" or make them.) First among them is a long pole, like a broom handle or hockey stick, with a hook or bent nail on one end. If you don't want to actually enter a dumpster, make your pole sturdy enough to pull out furniture. Heavy gloves are essential. Shoes with nail-resistant soles are advisable. And if you're going to dive in, the tougher your clothes, the better.

## GETTING RID OF STUFF

If your community isn't interested in a regular junk-swap, then tag sales, thrift stores, and rummage sales are good options when it comes time to get rid of some of your stuff.

• **Tag sales** can be thrown at a moment's notice, or as a cooperative wing-ding with a half-dozen friends and neighbors. The cooperative route definitely makes the day pass faster, spreads the burden, and complicates the finances. (The crowd of people on your lawn also helps create the illusion that your junk is fabulous.)

Follow these important tag-sale rules, and your event is guaranteed to be a success:

\* **Make signs that are clear at a distance** — a ten-car pile-up in front of your sign will detract from the message.

\* **Put your junk out clean, and have an extension cord handy to prove that your Elvis lamp works.**

\* **Be cheap.** Remember, the idea is to pass the stuff along, not to get rich.

\* **Call it quits early and replace your signs with new ones that read "Free Stuff."**

• **Thrift stores** often will take things on consignment. When you drop off your John Denver albums and your extra chest-of-drawers, your name goes on the price tag. When (well, if) someone buys the items, you get a cut. Call and ask about the consignment policy before you lug your treasures to a store. Make sure everything is clean when you drop it off. (Your state may have

a policy on mattresses, which can spread diseases. Most Goodwills don't accept them.)

If you don't want to hang around for the money, there are numerous organizations that will be delighted to receive your donated goods (see *Where to Take It*). Some even take ugly, broken junk, and turn it into clean, useful merchandise. The giants of the thrift-store world are Goodwill and the Salvation Army.

Some 300 million dollars, or one-half of the money Goodwill uses to fund its job programs, comes from its donated-goods program. In 1989, people brought 569 million pounds of clothing, furniture, and appliances to the 1,200 Goodwill stores and other drop-off sites. That's 284,500 tons of stuff that not only avoided the landfill, but also got a second round of use. Of the items that don't sell, or that Goodwill's disabled clients can't fix, some are thrown out, while others are sold in bulk to salvagers or overseas markets.

The Salvation Army is in the same business, with its social concern the

## WHERE TO TAKE IT ... AND RESOURCES

Goodwill and the Salvation Army aren't the only places that need your discards — in fact, they sometimes get more than they can handle. If you're trying to get rid of something with a little life left in it, try the suggestions below. Consult your Yellow Pages to find the organizations in your area. Don't assume local organizations want the stuff — call first.

### Appliances, large and small:

Schools\*, thrift stores

**Art supplies:** Children's centers, schools, theater and dance centers

**Auto batteries:** Auto-parts stores

**Books:** Children's centers, day-care centers, libraries, schools, thrift

stores, used-book stores

**Cloth:** Children's centers, learning centers, theater and dance centers

**Clothes hangers:** Dry cleaners

**Clothing:** Schools, shelters†, thrift stores, theater and dance centers

**Furniture:** Shelters, theater and dance centers, thrift stores

**Homemaking stuff:** Schools, shelters, thrift stores

**Magazines:** Children's centers, libraries, schools

**Metals:** Look in your Yellow Pages for recyclers, scrap dealers, or salvagers

**Office equipment:** Arts centers and organizations, non-profit organizations, schools, shelters

\* Schools include, as appropriate, centers for the blind or hearing impaired, grade and high schools, Head Start programs, music schools, nursery schools, universities, and vocational schools.

† Shelters include family shelters, homeless shelters, teenage-runaway agencies, women's shelters, etc.

rehabilitation of people with alcohol or drug problems. Its 1,363 thrift stores sell clothing, furniture, and household goods which are mended by clients. The Salvation Army doesn't keep track of how much stuff is dropped in the thousands of donation boxes found in parking lots nationwide.

• **Rummage sales** are generally thrown by a church or a charity, in order to raise money. Their offerings vary — some specialize in furniture and housewares, others, like the Riverside Church in New York City, concentrate on clothing. Ruth Herrmann, the 80-year-old dynamo behind the church's clothing pro-

gram, says the biannual clothing sales bring in 700 people and \$18,000 to \$22,500. The clothing for the sale is culled from a constant stream of donations, most of which is passed on free to those in need. This two-tier distribution program works well, says Ms. Herrmann, because many people are too embarrassed to take clothing that the church offers free on a daily basis. "It's silly," she says. "But that's the way they feel."

If you don't belong to a church or community group that throws an annual rummage sale, keep an eye on the community listings in your local paper, and you'll probably see requests for donated items. Be sure

your donations are clean and as sound as you can make them. They'll be more likely to sell, and less likely to be packed in the cellar or hauled to the landfill at day's end.

Finally, when you do lug your too-tight boots and the living-room curtains down to the thrift store or the church basement, take a minute to browse. You might find that someone else's discarded curtains are just what you've been looking for, which means your demand for the item won't use new resources. By doing your shopping there, you'll be "closing the loop" — providing markets for useful goods that might otherwise be thrown away. ♻️



**One family's throw-away is another's prize: Corey Smith's antique bed was rescued from a trash bin.**

**Paint:** Schools, theater and dance centers, vocational rehab centers

**Paper:** Children's centers, day-care centers, learning centers, schools

**Records and cassettes:** children's centers, libraries, schools, thrift stores, used-book and -record stores

**School/Institutional furniture:** Arts centers, non-profit organizations, schools, shelters

**Tools:** Children's centers, schools,

thrift stores, vocational rehab centers

**Toys:** Day-care centers, learning centers, libraries, parks and recreation departments, schools, thrift stores

## RESOURCES

### BUILDING WITH JUNK

by Jim Broadstreet. 155 pages. Loompanics Unlimited, P.O. Box 1197, Port Townsend, WA 98368

\$22.95 ppd. Where to find second-hand materials, and how to turn them into a house.

### HOW TO SURVIVE WITHOUT A SALARY: LEARNING HOW TO LIVE THE CONSUMER LIFESTYLE

by Charles Long. 232 pages. Summerhill Press Ltd. Order from Firefly Books Ltd., 250 Sparks Ave., Willowdale, Ontario M2H 2S4 Canada; \$13.85 ppd. An extremely practical book on hopping off the consumer treadmill.

### NADDUM NEWS

1200 Old Dump Rd., Big Fork, MT 59911; (406) 837-5548. \$20 a year for the dumpster-diver's bimonthly bible.

### WASTE EXCHANGES

Businesses can write to the EPA for a list of waste-exchange programs. Pollution Prevention Information Clearinghouse, c/o SAIC, 8400 Westpark Dr., McLean, VA 22102; (703) 821-4800; fax (703) 821-4784



## Guide to the Three Rs:

# REDUCE, REFUSE, RECYCLE

Has someone hurled jargon at you recently, rattling off the phrase "reduce, reuse, recycle"? Did you feel out of the loop? Relax. The revised Three Rs are easier to grasp than reading, 'riting, and 'rithmetic (and more apt, because these three words actually begin with 'R').

The point of this new triumvirate is simple: We need to change the way we think about buying and using everything from food to furniture, adjusting our *habits* to minimize waste. America's philosophy of consumption needs an overhaul.



 NO FRILLS

## REDUCE

By this, the pundits mean you should try to keep garbage out of your house in the first place, so you never have to worry about getting rid of it. Say you could buy pickles in a glass jar, or pickles in a plastic tub wrapped in newspaper nestled in foam peanuts and shrink-wrapped. You go garbage-free, right? Garbage may be the ten extra layers of packaging on an ice-cream bar, or a cheap toaster that'll croak within the year — anything that sends too much/too soon to the landfill. So:

## REUSE

It sounds simple. Instead of throwing away grocery bags and peanut butter jars, you keep them, right? Put your garbage in the bags, and fill the jars with marbles or flowers.

Come on — that's reusing for toddlers. Full-grown reusers never buy anything new that they can get used, and they never throw out anything that's got a twitch of life left in it. If you like to buy brand-new everything, you may need to start slow, by working to keep your old stuff around longer before you let it go. Specifically:

● **MAINTAIN YOUR STUFF. IF YOU CLEAN AND GREASE YOUR LAWN MOWER EACH MONTH, IT WILL RUN BETTER AND LONGER. USE COLD AND GENTLE WASHER SETTINGS TO MAKE CLOTHES LAST LONGER.**

● **REUSE OTHER PEOPLE'S STUFF. HAUNT THRIFT STORES AND RUMMAGE SALES, WHERE YOU CAN BUY THINGS SECOND-HAND. ALSO, GET OVER YOUR EMBARRASSMENT ABOUT BORROWING TOOLS AND APPLIANCES YOU DON'T USE OFTEN.**

● **CHANGE THE OIL IN YOUR CAR REGULARLY — YOU'LL ADD YEARS TO YOUR ENGINE.**

● **FIX YOUR OWN STUFF. WHEN YOUR APPLIANCES, DISHES, TOYS, OR TOOLS BREAK, DO YOUR DARDEST TO MEND THEM, EVEN IF IT MEANS YOU PUT THEM TO AN "INFERIOR" USE AFTERWARD (A GLUED-TOGETHER MUG CAN BE USED TO HOLD PENCILS OR NAILS). BUY A GOOD REPAIR MANUAL TO KEEP APPLIANCES IN YOUR HOUSE, AND OUT OF THE LANDFILL.**

● **REUSE OTHER PEOPLE'S STUFF. HAUNT THRIFT STORES AND RUMMAGE SALES, WHERE YOU CAN BUY THINGS**

**SECOND-HAND. ALSO, GET OVER YOUR EMBARRASSMENT ABOUT**

**BORROWING TOOLS AND APPLIANCES YOU DON'T USE OFTEN.**



● **MAKE SURE YOUR STUFF GETS REUSED. WHEN YOU GATHER UP CLOTHING, OLD APPLIANCES, AND OTHER THINGS YOU NO LONGER WANT, USE THRIFT STORES, RUMMAGE SALES, YARD SALES, OR YOUR FAVORITE CHARITY AUCTION TO HELP YOUR DISCARDS FIND A NEW LEASE ON LIFE — IN SOMEONE ELSE'S HOME.**

● **DIVE INTO A JUMPSTER! IF YOUR NEIGHBOR HAS CONDEMNED A USEFUL ITEM TO THE GARBAGE TRUCK, GRAB IT. RATHER THAN FEELING EMBARRASSED, FEEL FORTUNATE THAT YOU THWARTED A WASTEFUL ACT.**

## RECYCLE

The most popular 'R' word is actually the last resort. If you've gotta have something — a dishpan or a jar of caviar, for example — whether you can reuse it or not, make sure you can recycle what remains. Ideally, make sure it can be closed-loop recycled — for example, aluminum, steel, and glass containers are often made back into similar

containers, closing the loop. This eliminates the need for virgin resources to make each new item. On the other hand, plastic and multi-material containers, with the (so far) occasional exception of detergent and soda bottles, cascade



to a lesser use — like a plastic flower pot — when they're recycled. To that end:

● **MAKE SURE YOU KNOW WHAT MATERIALS YOUR COMMUNITY RECYCLES.**

● **PURCHASE THOSE MATERIALS AS YOU SHOP FOR FOODS AND HOUSEHOLD GOODS.**

● **PUSH YOUR COMMUNITY TO THE LIMIT: THEY MAY BE ABLE TO COLLECT OLD STEEL PANS ALONG WITH THE STEEL CANS, BUT ARE UNAWARE OF IT.**



# Population

RED-HOT REALITIES FOR A FINITE PLANET



TALKING ABOUT OVERPOPULATION LEADS YOU RIGHT ACROSS A BED OF COALS — RED-HOT REALITIES LIKE SEX, DEATH, WEALTH, POVERTY, POWER, AND MORALITY. THERE ARE NO EASY ANSWERS. BUT HAVING COME THIS FAR WITH A MAGAZINE LIKE **GARBAGE**, YOU MUST BE WILLING TO CONSIDER SOME OF THE CAUSES AND EFFECTS OF ENVIRONMENTAL PROBLEMS. ARGUMENTS RAGE ABOUT MAXIMUM SUSTAINABLE NUMBERS, BUT IT'S A TRUISM THAT THE MORE OF US THERE ARE ON A FINITE PLANET, THE LESS RAW MATERIAL AND ROOM TO MOVE (OR TIME TO PLAN).

TAKING STEPS TO CURB POPULATION GROWTH COURTS CONFLICT WITH A SPECTACULAR ARRAY OF SPECIAL-INTEREST GROUPS, FROM ANTI-ABORTIONISTS TO A HANDFUL OF RADICAL FEMINISTS WHO REGARD GESTATIONAL PROCESSES AS SACROSANCT. OTHERS WHO TAKE A DIM VIEW OF POPULATION CONTROL ARE MEMBERS OF MINORITY GROUPS AND NATIVE PEOPLES, WHO HAVE GOOD REASON TO WORRY THAT LIMITING THEIR NUMBERS COULD LEAD TO THEIR EXTINCTION.

BY STEPHANIE MILLS

**A**t first glance, it may be hard to see how overpopulation could be your problem — the effects of overpopulation are seldom evident as such. But population is a factor (although not the only one) in every problem associated with urbanization and industrialization — growth.

Complicating our understanding further, there are dramatic regional differences in population growth-rates, and in per-capita resource-consumption rates, which means that the population problem is manifested differently in different parts of the world. In the developed world, overpopulation makes itself noticeable by compounding the consequences of excess: pollution, solid-waste disposal, automotive congestion, urban sprawl. In the developing world, the struggle for subsistence — from the land or sea — intensifies with every generation: Increasing numbers of subsistence farmers are driven onto lands that are unsuitable for farming; women are driven further afield in the quest for firewood; and fishery after fishery collapses from contamination and overexploitation. And, according to Zero Population Growth, for the past 25 years the rate of increase in atmospheric CO<sub>2</sub> — the greenhouse gas — has matched the rate of population growth almost exactly. So even in the wilderness you encounter adverse environmental effects, such as acid rain, which have been amplified and multiplied by overpopulation.

Once you grasp the implications of rapid population growth, it becomes difficult not to be strident about it. I know. I broke into the ecology biz back in 1969, announcing in my college commencement address something that seemed to be only common sense: People like myself, who thought that population was becoming an overwhelming problem, ought to do something about it, and not have children.

So I haven't. It seemed simple enough to me. The only thing that's going to reverse overpopulation is reducing family size to below replacement level. All that requires is birth control ... and rather a lot of social change.

### THE AMAZING MATING MACHINE

**B**ut the time and room for debate are shrinking. World population stands at 5.4 billion now, and is expected to double in 39 years, according to the Population Reference Bureau.

Consider our history: In 35,000 B.C., according to best estimates, our species numbered 3 million. Livelihood was earned by hunting and gathering — very low-tech and sustainable. By 8,000 B.C., gardening had been invented, and our numbers increased to 8 million. With the arrival of the Bronze Age 4,000 years later, the human population reached 86 million. By the beginning of the Common Era, the numbers had increased to 300 million. At the dawn of the Renaissance 1,400 years later, there were 336 million people in the world. Steady growth that was alarming only if you happened to be an aboriginal occupant of a "new

world," standing in the path of some empire's expansion. But in recent centuries, the growth has been compounding itself with shocking effect.

"In 1830, 1 billion people inhabited the Earth," writes Population Institute President Werner Fornos, in *Technology Review*. "A century passed before the population reached 2 billion. Thirty years later, in 1960, it hit 3 billion; 15 years later, 4 billion; and by 1986 — only 11 years later — 5 billion ... the 6 billion mark could be reached in 1995."

How did this runaway phenomenon come about? The basic constraints on the growth of any population of organisms are food supply, disease, and predation. Using our unique tool- and language-making gifts, we human beings have cleverly (if not wisely) evaded these constraints.

Since the days when there were only a few million of us, there have been quantum changes. Early on, we shifted from a nomadic to an agricultural civilization, increasing our food supplies and our ability to store food. This great change also marked the beginning of serious deforestation and the buildup of salt in irrigated lands. More recently, we tapped into the finite and never-to-be-repeated bonus of fossil fuels, which helped power the industrialization of agriculture and spurred urbanization. Disease control and greater food security decreased infant mortality.

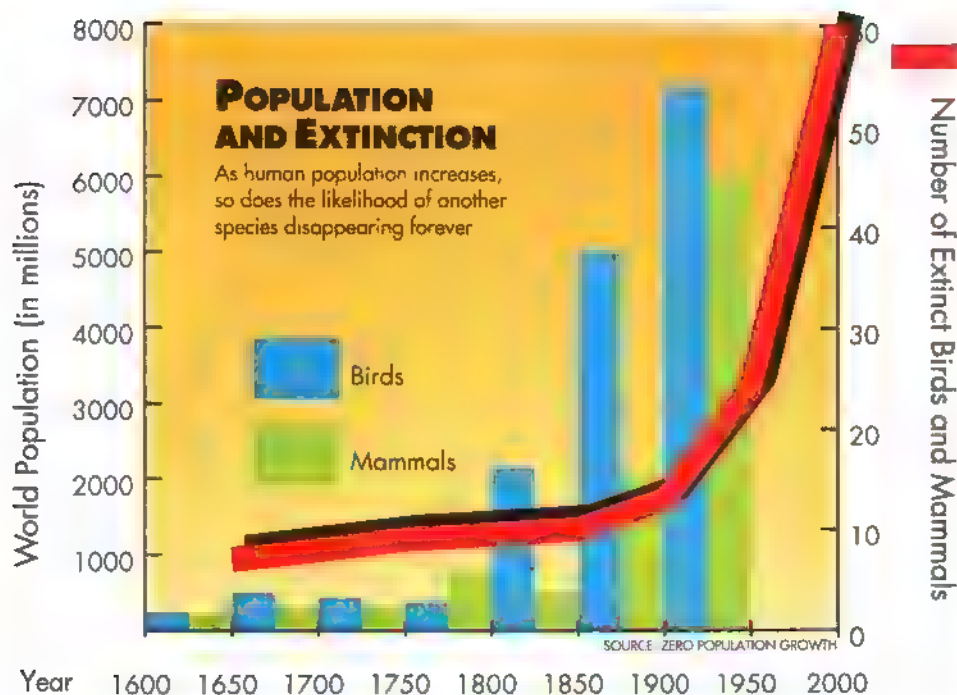
This change in death rates is extremely significant. While human reproductive potential is fairly constant, the question of whether you live to exercise it is not. When the annual birth-rate exceeds the death rate, the population grows. So when family size exceeds two children, population growth follows. Every minute now, 180 people are born and 100 die, for a net gain of about 11,000 souls per hour.

### EXPONENTIAL GROWTH

**P**opulation growth works like compound interest. If a couple has four children (the average number a woman bears today is 3.5), they've replaced themselves twice in one generation. If each of the children follows suit, there will be 16 grandchildren, then 64 great-grandchildren. In four generations, this Adam and Eve have multiplied







themselves better than 200 times. (How many showed up at *your* last family reunion?)

Mother Nature doesn't exhibit much tolerance for such growth patterns. In *Population Biology*, Thomas C. Emmel writes: "Exponential growth is abruptly terminated when the carrying capacity of the environment is surpassed and environmental resistance becomes effective more or less suddenly. Such growth curves are characteristic of rapidly reproducing and maturing annual plants, seasonal insect flushes, and man's population growth in recent years, but in general, they are very short-lived phenomena for obvious reasons."

There is a French riddle that illustrates exponential growth. Here's how it appeared in the 1972 classic, *Limits to Growth*:

"Suppose you own a pond on which a water lily is growing. The lily plant doubles in size each day. If the lily were allowed to grow unchecked, it would completely cover the pond in 30 days, choking off the other forms of life in the water. For a long time, the lily plant seems small, and so you decide not to worry about cutting it back until it covers half the pond. On what day will that be?"

On the 29th day, of course. You have one day to save the pond."

### THE MORE THE MERRIER?

Well, things are getting pretty thick around the old lily pond, but we're still in denial about the necessity to limit our numbers. You can probably find some reasons in your own personal experience. How could all those perfectly human impulses — to bring forth and love children, to do like mom and dad did (or better) — be anything but good? The prospects of another baby to enjoy and another person to share the work and carry on the family name are compelling to parents, especially in agrarian societies. That can make zero population growth a tough sell in the developing world.

One screeching brake on our developing a useful approach to the population problem is theological. The dominant religions of the West reflect the premise that *homo sapiens* is the most important critter on the planet — God made man in His own image, after all — and this is reflected in the Biblical injunction to "be fruitful and multiply, and replenish the earth, and subdue it." These days there is a lively discussion over the accuracy of that King James translation, but valid or not, generations have read it as a manifest destiny.

Another impediment to perceiving and acting on overpopulation has been conventional economics, which activist and author Hazel Henderson has called "a form of brain damage." For the most part, economists have been so enraptured by growth, and the magic of markets, that they've been blind to growth's downside. The problem with economics is that it only values the things it can count. Much of what constitutes quality of life can't be measured or counted, and so is omitted from the definition of a successful economic system.

For example, economist Julian Simon, whose work has served as a rationalization for recent U.S. population non-policy, maintains that population growth generates its own solutions. An increased number of humans means not only increased inventiveness, but also additional demand, which will drive a search for substitutes for depleted resources, clean air,



and fresh water. Even if this worked, however, the resource for which there is no substitute is biodiversity. Dr. Simon's cheery optimism is bad news for other species.

## WHO'S TO BLAME FOR OVERPOPULATION?

Even among those who agree overpopulation is a problem, there are strong disagreements. Within the environmental and social-change movements, population debate from the mid-'70s onward drifted into a polarity of contending world views, which I will call the Darwinists and the Marxists. Each defines the problem differently. (My apologies to scholars and devotees of these great thinkers, for employing the names as shorthand.)

To Darwinists, or "biological determinists," as they are sometimes known, the arrival of population equilibrium is an inevitability. The only question is whether it will come about through a decrease in birth rates or an increase in death rates from famine, pandemic disease, and war. Some Darwinists, like Earth First! co-founder Dave Foreman, have inferred that starvation and fatal diseases still have their rightful place in human ecology. It's a pretty unpopular view, but it does point out that our reluctance to employ birth control is far exceeded by our reluctance to give up death control.

Darwinists see planet Earth as an ecosystem, and our species as just one among millions, interdependent with all, and subject to the laws of nature. The detachment in this evolutionary view can tip over into an insensitivity to the tragedies of individual lives, and an obtuseness about politics. For one thing, human beings have all the votes on this issue, and it's all too human to place one's individual needs and desires before the good of the whole. For another, although *homo sapiens* is all one species, disregarding the inequality of means among people falsifies the picture.

The "Marxist" sector views the

problem as one of power — who's got it and who doesn't. They conclude that social oppression and economic imperialism are the essential causes of all great ills. The belief that scarcity is socially caused and socially curable has led analysts from this camp to regard any proposal to limit human numbers as an evasion of the real issue — revolutionizing social and economic arrangements.

Besides these people, there are the feminists, whose claim to an opinion on overpopulation is perhaps the most secure, because it is women's bodies and women's lives that determine — and are mostly determined by — reproduction. In all this discussion, it is important to remember that childbearing and nurturing have been women's lot, while policy-making has been the domain of men. Women are well aware that childbearing is one of the greatest causes of female mortality, and that generous spacing between births is healthier for all concerned, whether families are rich or poor. Consequently, mothers may have a slightly different take on the advantages of population growth than do merchants, bishops, generals, or kings.

"Overpopulation is just a symptom of a basic human-rights problem," says Hazel Henderson. The general idea is that if women were fully compensated participants in the economic life of their communities, and thus emboldened to control their fertility; and if men assumed equal responsibility for household duties and the nurture of their offspring, smaller families and greater

prosperity might well ensue. As it stands now, sexism is such a pervasive force in the world that a preference for male babies even drives Chinese couples into violations of their country's stringent one-child-per-family policy. And in most of Asia, North Africa, and Latin America the death rate for young women is higher than that of men as a consequence of neglect.

## CARRYING CAPACITY: RECOGNIZING LIMITS

So — suppose we admit there's a complex interplay of social, cultural, and biological factors driving overpopulation. And that — thanks to the intervention of medicine, technology, and trade

## How to UNDERMINE OVERPOPULATION

by Monte Paulsen

### Cherish fewer children

Support the decisions of relatives and friends who have two, one, or even no children. Avoid pressuring your children to bear grandchildren. And don't buy the stereotype that says single kids and single adults are unhappy — it ain't so!

### Spread the love around

If you've got a strong parental urge, consider adopting children rather than having your own. Make enriching the lives of other people's kids a part of your life.

### Onlies are O.K.

If you decide to have children, consider having only one; definitely stop at two. Each child born in the U.S. has an enormous impact on the environment, due to our heavy consumption of water, energy, and goods.

### Feed 'em local

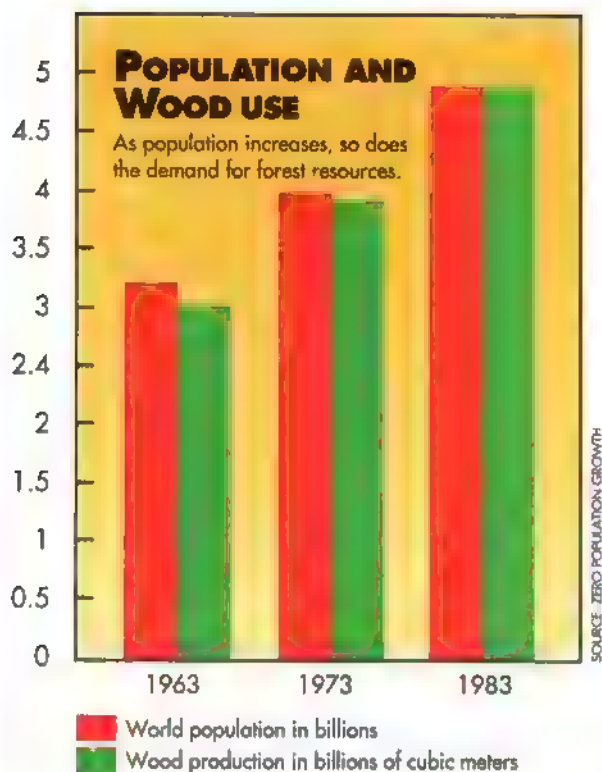
When developing nations use scarce cropland to grow food for export, they deprive their own populations of that land. Feed your family sustainably-produced foods from your area.

### Don't overconsume

The use of a disproportionate amount of resources in developed nations aggravates overpopulation in de-

continued on page 51





— the consequences of population growth aren't always obvious. That complexity means that any action taken by individuals, communities, nations, and the community of nations will likely offend *someone*. Nonetheless, on a finite planet, maximizing human reproduction clearly comes at great ecological cost, and a considerable cost in human suffering. What would be a positive goal for humanity in all of this?

We need to determine an optimum human carrying-capacity for Spaceship Earth, then limit

our numbers to that. Then we must get on with the colossal tasks of sustainable development in the third and fourth world, and sustainable de-development in the first. The number-crunching for this modest project began in earnest nearly 20 years ago.

The aforementioned *Limits to Growth* was the report of a global modelling study that explored Earth's human-carrying capacity. Using systems analysis, computer projections, and a veritable world of data, the authors played out numerous scenarios for the human future, based on different trends in food production, resources, population, industrial output, and pollution. Assuming no change in present patterns, the authors predicted a crash in both population and industrial capacity by the next century. That was the bad news. The good news was that the Earth could sustain indefinitely a population of 6 billion at a European standard of comfort. We're due to hit that 6 billion mark in four years, however.

Besides the sheer number of us, our environmental impact has also to do with the choices that we, industry, and government make about resource consumption and waste disposal; about land use and transportation; about energy generation and conservation. Decisions about all those things can magnify or modify the impact of the increased human numbers.

Ecologists Paul and Anne Ehrlich, in their recent book, *The Population Explosion*, suggest the following equation for thinking about some of these interactions: Impact equals Population X Affluence X Technology, or  $I=PAT$ . Understood that way, there's no single culprit.  $I=PAT$  helps explain why population is not just a problem of the developing countries. Although countries like the U.S. and Japan have relatively low populations, this is counteracted by the abundance of affluence and technology. According to the Ehrlich equation, the environmental impact of a baby born in the U.S. will be 35 times that of an Indian baby, and 280 times that of a Haitian child. Therefore it makes both practical and moral sense for people on the affluent side of the equation to reduce their impacts on the environment by reducing waste and, ultimately, consumption, as well as by reducing family size.

#### OVERPOPULATION: WHY IS IT HARD TO TALK ABOUT?

Of course, if there is to be such a thing as family planning, let alone population control, there will have to be good sex education and unlimited access to contraception and abortion (because no contraceptive method is 100-percent effective).

I notice that now I feel rather nervous making that assertion,



which was commonplace during the '70s. It's a measure of the chill and fear that the anti-abortion movement has imposed on the discourse. I am not, I confess, very eager to confront their unreason and occasional violence.

Their lobby has had disastrous effects: a 42-percent reduction in domestic family-planning funds; an increased incidence of teenage motherhood; a thwarted introduction to the U.S. of RU 486, a promising abortifacient drug widely used in France; and the reversal of our international population policy. A 1985 amendment to the Foreign Assistance Act eliminated U.S. funding to the United Nations Fund for Population Activities (UNFPA) and severely reduced our support of the International Planned Parenthood Federation (IPPF) on the grounds that they supported programs that condoned abortion. The funding cutoff hit UNFPA and IPPF at a time when the vast majority of countries in the developing world had subscribed to the voluntary reduction of population growth and the promotion of family planning, and were ready for help.

Few are immune to the fear. As a Congressman and U.S. Ambassador to the UN, George Bush spoke of the need to curb the world's fertility. But he's wimped out now, giving Senator Albert Gore cause to note that "An objective observer would have to conclude that Bush

probably changed his mind on this question because he is politically scared of a tiny minority within the right-to-life movement." Perhaps not all terrorists live offshore.

Suppose we can muster the political backbone to weather the controversy, to preserve reproductive rights, and to support international family planning (a big if, but suppose). The promising news is that, despite overpopulation being a touchy subject for polite conversation, among the thinkers who confront it the old polarity seems to be shifting. A consensus seems to have emerged. Thus we find that Paul and Anne Ehrlich, the premier population-bombers of our time, have become very explicit in their advocacy of solutions that are embedded in a larger social context. The Ehrlichs maintain that the essentials of reduced fertility are "adequate nutrition, proper sanitation, basic health care, education of women, and equal rights for women."

It's hard to imagine a principled and humane person disagreeing with this approach (although Marxists and Darwinists might differ on significant details of population-control programs — say, incentives and punishments around family size). Coming up with the understanding, will, and wealth to act on the problem may seem impossible, however. The price tag for bringing about a stable population of 8 billion in the year 2050 would be about \$300 billion, writes Chicago bioregionalist Beatrice Briggs, in the magazine *Conscious Choice*.

"While this is a staggering sum," she continues, "it is useful

to consider that in the U.S. each year we spend \$2 billion on firearms and hunting equipment, \$4 billion on athletic footwear, \$118 billion on advertising, and \$300 billion on defense." If that doesn't put the price of population control in perspective, just try to imagine the necessities imposed by decently accommodating twice the Earth's current population, 39 years hence. ☐

*Stephanie Mills has been a prolific writer and speaker on issues of population and bioregionalism for two decades. She is the author of Whatever Happened to Ecology, and the editor of In Praise of Nature. She lives in Maple City, Michigan.*

veloping nations. As the saying goes, "Use it up, wear it out. Make it do, or do without."

#### ☐ **Mandate equal opportunity for women**

Where women have better educational and economic opportunity, the birthrate has declined. Whether or not the fellows in the U.S. Congress ever pass the Equal Rights Amendment, it should be honored by everyone.

#### ☐ **Make contraceptives available globally**

During the next two decades, three billion young people will enter their reproductive years. Currently, only about 50 percent of fertile women have access to contraception.

#### ☐ **Don't outlaw abortion**

In the battle to undermine overpopulation, bear in mind that outlawing abortion doesn't improve family planning, it just leads to dangerous *illegal* abortions — and unwanted children.

#### ☐ **Limit development**

Due to population growth, the world's farmers have to feed 95 million more people with 24 million fewer tons of topsoil each year. Use your vote to promote land-use policies that preserve open space and farming, not only as a means of production, but also as a local way of life.

*Monte Paulsen is editor and publisher of Casco Bay Weekly, in Portland, Maine. This list was adapted from his series on personal ecology.*





# Drip Irrigation

## The Trickle-Down Theory of Watering

BY ROBERT KOURIK

**D**rip irrigation, where water droplets seep (instead of flow) into the soil, gives more growth with less water. Compared to conventional sprinklers, which lose moisture to the wind and surface evaporation, this watering method can save 50 percent (or more) of your irrigation water. True, hoses and sprinklers often lead to over-watering and people can, in most cases, greatly increase watering efficiency with better timing. But they can't match the savings afforded by drip irrigation. As fresh water becomes an over-used resource, this trickle-down watering system may be the *only* way to manage wisely our water supplies — and our gardens.



SCOTT MACNEIL



### IMPROVING YIELDS AND GROWTH

**A**lthough drip systems are a bit more complicated than dragging around a hose with an attached oscillating sprinkler, the benefits, in any climate, outweigh the hassles. How so? The gadget that regulates the slow flow of water is called an *emitter*. As water trickles out of the emitter, it soaks into the soil, directly nourishing thirsty roots.

Art Gaus, a horticulture specialist with the University of Missouri at Columbia, has used a drip system in his garden for nine years, even though Missouri's humid summers regularly nourish his plantings. One summer, using plastic mulch and a drip system, his garden produced 32 pounds of bush watermelons in just four square



**Water seeps from a soaker hose (below) and in-line emitter tubing (left) to feed deep roots.**



Owners of well-designed drip systems often report a marked reduction of such diseases as mildew, crown rot, and leaf rust.

Because a drip-irrigation system's polyethylene tubing and plastic parts are derived from fossil fuels, plan and install your system wisely, so you only have to do it once. With quality parts and adequate mulching, the plastic components should last for ten to twenty years. What's more, efficient water use will also conserve many gallons of fuel or kilowatts of electricity used to pump, purify, and distribute municipal water to your garden.

PHOTOS BY ROBERT KOURIK

feet of soil. Conventionally watering the same area usually produced 9 to 16 pounds of watermelons. He reckons that during California's droughts of 1980, '83, and '84, a well-timed drip system meant the difference between having a crop or losing a crop.

When people encounter drip irrigation for the first time, they are often concerned by the small wet spot that stains the soil's surface surrounding each emitter. "How can plants get by on just a few droplets?" they wonder. They don't realize that most of the water is efficiently dispersed below ground, out of view.

To understand how dripping works, buy a single emitter. Next, use an *emitter punch* (it cuts a tiny, circular hole) to pierce an opening near the bottom of an empty, plastic milk jug. Insert the emitter's barb, and fill the

one-gallon jug with water. Place the jug in a dry part of your garden. After the jug empties (which may take 24 hours because it's not under pressure), dig up the moistened soil next to the emitter (see illustration, left). The hole that remains graphically shows how the water will move through the soil.

Notice that the wet spot you've exposed is moist, but not soggy. This not-too-wet spot is the key to drip irrigation's superiority over all other forms of watering. With proper timing, a drip-irrigation system provides moisture without overly saturating the soil's pore spaces (which help the soil breathe). Thus, roots don't drown, the soil's beneficial bacteria can continue to release valuable nutrients, and harmful anaerobic fungi don't easily proliferate, allowing for better growth and greater yields.

## THE PARTS

**T**hree essential components make up the main assembly of a drip-irrigation system: A *backflow preventer* keeps water that's in the hosing from sucking dirt into your home's water pipes; a *fine-mesh filter* prevents the emitter's small orifices from clogging; and a *pressure regulator* keeps the non-threaded drip fittings from blowing apart. Appendages to the main assembly include polyethylene hosing and branched lines of drip hose called *laterals* or *subsystems*, each with emitters to control water flow (see illustration, following page).

To begin installing a drip system, use the garden-hose bib (faucet) closest to your plantings. First, connect the backflow preventer at every hose-bib that uses a drip system. The best



# Drip-irrigation systems help any garden flourish, in any climate.

backflow preventer for a hose-bib assembly is a check-valve, which costs \$6 to \$20. The check-valve should be installed with the arrow facing *away* from the hose-bib, toward the garden.

Next comes the filter, often the Achilles heel of a drip-irrigation system. Without a good filter, the emitters can clog. Routinely cleaning the filter is essential. But we sometimes forget about filters that have to be disassembled for cleaning. Consider purchasing a Y-filter with a ball-valve for easy flushing. Priced from \$12 to \$15, a Y-filter is more expensive than other filters, but it's easily maintained.

The pressure regulator should keep water pressure below 25 pounds per-square-inch (psi). A hose that's porous (to be discussed below) must be kept below 10 psi, so the special fittings don't leak. Good-quality pressure regulators are sold with a specific rating of either 10, 15, 20, or 25 psi. In the main assembly, the pressure regulator must always be attached *after* the filter, so full pressure is available to flush the filter's screen.

## WAYS TO DRIP

There are three basic types of drip systems: porous hose, drip irrigation hose with punched-in emitters, and in-line emitter tubing. Each has various benefits and limitations.

- **Porous hose**, also called soaker hose, isn't true drip irrigation because water oozes through the hose's *entire* surface (as opposed to dribbling from the end of an emitter). But it's an efficient, low-volume way to water. What's more, porous hose is comprised of either used tires or new tire trimmings combined with low-density polyethylene. So besides conserving water, you're supporting tire recycling.

The benefits: Porous hose is sturdy

and easy to attach to your hose-bib, and flexible for snaking it around plantings. Also, it can be buried in the soil; it works under pressure as low as 10 psi; and it's readily available through mail-order companies.

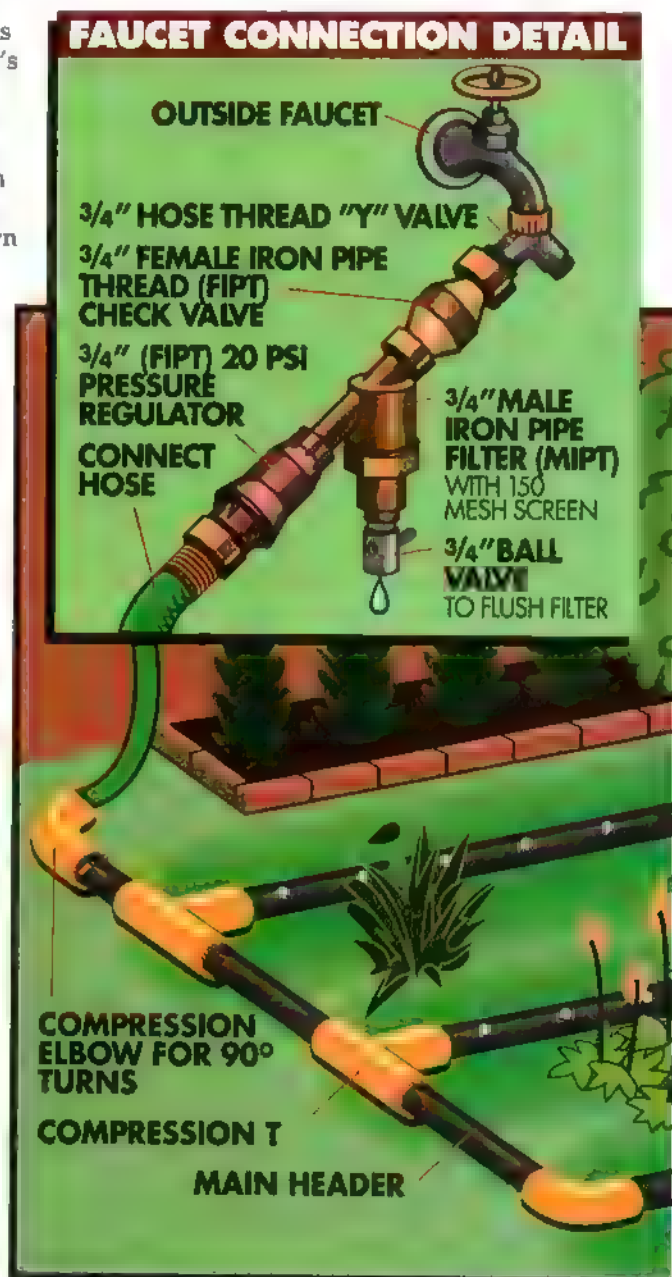
The drawbacks: The 5/8-inch diameter version is rather bulky; the hose clamps (often sold to guarantee the insert fittings don't leak) are expensive and eventually rust; and unchlorinated well water can produce an algae slime that seals the pores inside the tubing. What's more, porous hose can be used only on flat ground, to avoid variations in the flow.

Be wary of manufacturer's guidelines on how far apart to space each length of porous hose. An employee of a mail-order company that carries porous hose followed the company's guidelines for spacing the hose below ground. But the laterals were too far apart, and his lawn ended up with alternating stripes of green and brown. To get the brown out, he had to double the number of laterals. So before you bury a porous hose, do a test run to see how wide the wet spot will be for a given length of irrigation.

- **Emitters** come in flow rates of 1/2, one, two, and four gallons-per-hour (gph). They're inserted into a 1/2-inch-diameter (18mm), polyethylene drip-irrigation hose. Emitters are commonly used for what I call "point-source" irrigation, where one emitter is the only water source for each plant. There are also *regular* and *pressure-compensating* emitters. With regular emitters, the flow rate from one end of a hose to another can vary considerably. Pressure-compensating emitters are designed to deliver the same amount of water regardless of your garden's slope or the length of the drip-hose. If variations in your garden's elevation total more than 20 feet, or the drip hosing totals more than 100 feet,

you need pressure-compensating emitters. They cost 30 to 100 percent more than regular emitters, but they ensure that the flow is consistent throughout a punched-in emitter system.

The plusses: A pressure-compensating emitter with a drip hose easily winds around plantings; the connector fittings (called *compression fittings*) don't leak and they seal better with an increase in pressure (up to the system's limit of 25 psi); the emitters distribute water evenly and they're rated to work at a wide range of pressure (from 10 to 25 psi). Also, pressure-compensating emitters are less likely to clog than porous tubing; they can be punched into the



tubing exactly where the plant's roots are located; and they can distribute water as slowly as 1/2 gph for a gentle soak.

The limitations: Parts are not as widely available by mail-order as are those for a porous-hose system; the emitter's stem will get brittle with age and can easily snap off during weeding; in a large garden, installing hundreds of emitters can get pretty tiring.

• **In-line emitters** afford the best mix of efficiency, ease of installation, and resistance to clogging. The tubing is about 1/2 inch in diameter (16mm as opposed to 18mm for a "regular," 1/2-inch drip hose) and comes with emitters spaced at regular intervals inside the tubing, rated to dispense either 1/2 or one gph. These internal emitters are arranged to create a continual vortex that keeps sand or silt in suspension, so they won't clog the system. Slightly below the soil's surface, internal emitters leave bulbous-shaped wet spots that meet to form one continuous "moist zone." (The hose is available in both non-compensating and pressure-compensating versions.)

The benefits: Pressure-compensated, in-line emitters are easy to install and they clog less than porous tubing; of any system, they work under the greatest range of pressure (five to 25 psi); and they provide consistent flow rates, even on hilly terrain. Also, there are no external parts to snap off; the connector fittings don't leak; and the compression fittings seal better than the clamps that attach to porous hose.

The drawbacks: They require extra planning for plants placed far apart and at odd intervals; they aren't as pliable as porous hose; and they aren't carried by very many mail-order or retail outlets.

### FREQUENT, "SHALLOW" WATERING

To spur moisture and nutrient absorption, concentrate irrigation and fertilizers in the upper soil layer. Frequent waterings (if you avoid puddling) produce the best growth. In rainy areas, if watered just enough be-

tween periodic storms to maintain a moist (but not wet) soil, your garden will produce higher vegetable yields or lush, ornamental foliage.

I prefer frequent watering with small amounts of water, sort of like "topping off the tank". Here in California, after the winter rains are over, irrigation begins when the soil has reached an ideal moisture level — not too wet and not too dry. The goal is to replace the amount of moisture lost to both evaporation from the soil and transpiration from the plant's leaves (called the evapotranspiration rate, or ET), while adding enough extra water for gorgeous growth. Your County Cooperative Extension can give you the ET rate for your regional climate, and instruct you on how to figure optimal irrigation times for your drip system. For one of my clients, drought-resistant plantings needed only four to eight minutes of irrigation per day to maintain vibrant, healthy growth.

Of course, if your water supply is extremely limited, then infrequent waterings may be the only option. Instead of running the drip system for a long, continuous period, break the irrigation time into several waterings. This allows the soil to drain and breathe.

If you're intimidated by any device more complicated than a hand-operated can opener, rest assured that drip irrigation is nowhere near as complicated as it looks. Think of all the parts as an adult version of Erector Sets. Start with a small system, watch the results as the plants grow, and adjust accordingly before expanding. Drip irrigation isn't just a desperate technology for water-strapped Westerners. It's a water-conserving tool that can make any garden flourish, in any climate. ☞

The drip-irrigation hardware mentioned in this article is available from:

- The Natural Gardening Company  
San Anselmo, CA (415) 456-5060
- Harmony Farm Supply  
Graton, CA (707) 823-9125
- The Urban Farmer  
San Francisco, CA (415) 661-2204
- Gardener's Supply Co.  
Burlington, VT (800) 548-4784

This article is excerpted from Robert Kourik's forthcoming book, *Drip Irrigation for the Home Landscape*. To be notified of publication, write to Edible Publications, PO Box 1841, Santa Rosa, CA 95402.



SCOTT MACNEILL



# Who Owns Exxon? We Do.

Thanks to "pension-fund socialism," environmentalists may turn out to be the economic reformers of the 1990s. But who knows if they will succeed.

**T**he most intriguing thing about the Valdez Principles — newly hatched guidelines for corporate environmental practice — is neither the companies that have signed up to endorse it, nor those that refused, nor the majority still mulling it over — nor even the engaging, clever activists who put the Principles together. The intriguing aspect is the investment climate which provoked those activists in the first place. It's as if, since 1974, the United States economy has been the victim of a giant-scale practical joke. And only now has anybody started to figure out the punch line.

If a nightclub comic were to tell the joke, he might start by asking a simple question. Who owns most mainstream companies? Robber barons, right? Fat cats. Investors with last names like Du Pont, Morgan, and Mellon — descendants of the industrial exploiters of the 19th century — plus a few modern-day barons like Trump, Milken, and Kravis. They all learned what Kurt Vonnegut Jr. described so evocatively in his 1965 novel *God Bless You Mr.*

*Rosewater*: How to slurp from the "money river," the river of profits from investment, "the widest, deepest river of wealth ever known to man." If you befriended or scared the right people, said Vonnegut's lead character Eliot Rosewater (a disenchanted, middle-aged rich kid with a drinking problem), you would "be shown a place on the riverbank, and handed a bucket all your own. Slurp as much as you want, but try to keep the racket of your slurping down. A poor man might hear." (Incidentally, although *Rosewater* never achieved the popularity of *Slaughter-*

*house 5*, it is a cult favorite among disenchanted rich kids — with or without drinking problems.)

In the early 1970s, with almost no public notice (not even their own), the workers of America learned to slurp at the money river. One person who *did* notice was the eminent Austrian-born management/economics writer Peter Drucker. In his 1976 book *The Unseen Revolution*, he said the United States was becoming the world's first truly socialist country. American teachers, teamsters, corporate full-timers and city employees were, in aggregate, squirrelling away billions in more than 50,000 pension and retirement funds. The funds, in turn, invested that money in the stock market. By now, as Drucker pointed out in the *Harvard Business Review* this spring, pension funds have \$2.5 trillion in assets, are enormous industrial lenders, and own 40 percent of American common stock — enough for a controlling interest in most companies. Who owns Exxon, GM, Du Pont and Citicorp? We do — at least those of us with pensions.

But the joke's on us. We might own America, but our influence falls within harshly narrow limits. The reasons go back to the 1940s, when then General Motors chairman Charles Wilson designed the first modern pension fund. He decreed that it should invest in all possible stocks, instead of just GM. That way, if GM's stock price suddenly collapsed, its pensioners (who vividly remembered the Great Depression) would be protected. Wilson was probably thinking of this pension fund when he said that what was good for GM was good for the country.

Wilson's design caught on among corporations, and Congress eventually wrote it into law, more or less, as the 1974 Employee's Retirement Security Act — colloquially known in investment circles as "ERISA" (pronounced to rhyme with "Melissa"). By the



BY ART KLEINER

1970s, pension-fund investments had become gigantic child-tyrants in the market, fussed over by independent stock analysts, whose only job (as "fiduciaries") was to get the best possible payback every day for their aging beneficiaries. Because of protective state laws, these fiduciaries could not take a personal interest in any company, or even bet a long shot; if they lost money for their pensioners, they could be liable for malpractice. This liability scared away banks, and suddenly small boutiques opened for managing pension funds, using computers to track stock performance on an almost moment-by-moment basis.

You may remember the "Greed is Good" speech in the movie *Wall Street*, where takeover pirate Gordon Gekko persuades stockholders that the management of their company is more corrupt than he is. In real life, his audience would have been pension-fund managers' representatives. Most of them would have felt honor-bound to go along with his offer of a higher stock price, no matter what they thought of his ethics. They would care as little for the company as a bookie might care for the health of Lucky Lady running in the 12th tomorrow at Aqueduct, and for the same reasons. Tomorrow, after all, would be another horse race — and they might not even own the company by then.

Thus, however well-intentioned its design, the pension-fund system has evolved into a monstrosity. It faces the same built-in dilemma as Social Security — funding an ever-growing proportion of senior citizens from an ever-shrinking work force. Another problem stems from the nature of trading: if one investor goes after quick gains, he or she will likely prosper. But if all major investors do the

same, they will all lose. (Indeed, many pension funds, despite best efforts, have consistently undershot the stock market.) Meanwhile, the pension funds' need for quick profits, on top of debt from Gekko-like takeovers (which pension funds encourage) pressures managers to cut back new investments to the bone. That makes it hard for a healthy economy to thrive in the long run. It also undercuts environmental protection: Consider Pacific Lumber's desperate battles to cut down its old-growth redwoods in California, to satisfy its debt-laden new corporate parent, Maxxam. In the end, the system of pension-fund investment hurts the very future which pensions were designed to safeguard in the first place. End of joke. Drum roll.

Yet that punch line holds a hidden promise. Some sharp political veterans now have jobs managing pension funds: former New York City comptroller Harrison Goldin, current comptroller Elizabeth Holtzman, and Gray Davis, the chief of staff of former California Governor Jerry Brown. What if they — and the workers they

represent — woke up to the fact that they own the corporations? What attitudes might emerge about growth, the legacy of the future, the way companies are managed? Eventually somebody had to pose the question. During the past year or so, that task fell — of all people — to a group of environmentalists.

"The conscience of a company has to rest somewhere. The managers feel it's the CEO, the CEO feels he's accountable to his Board, and the Board is trying to second-guess the shareholders. So let's give our voice about ... building a kind of world that the children of our participants will live in. The quality of that society will be the single most important factor in the quality of their retirement."

The speaker was Wayne Silby, a slim, dark-haired man in his early 40s; the audience was the Financial Executives Institute, composed of the most powerful corporate pension-fund administrators from Fortune 100 companies. Originally from Iowa,



ILLUSTRATIONS BY KEITH BENDIS



*Faced with the Valdez Principles  
companies are introducing their own  
codes of environmental ethics, or  
debating such codes at top levels*

Silby has a quick-witted, sardonic, and yet wholesome mien; he could have been a model for the running shoe entrepreneur played by Kevin Kline in *The Big Chill*. He had traveled through India, then (after law school) had co-founded the Calvert Investment Group, which dealt in "variable-rate securities" — refinancing government-insured loans. Calvert had endured its own Big Chill-like rite of passage. In the late 1970s, employees worked in blue jeans and bare feet; "customers would come in," Wayne would later reminisce, "and put their life savings down on a cardboard table." Then one of his staffers tried to steal \$1.5 million. "I started wearing a tie the next day."

In 1982, Silby had set up a "social investment" fund within Calvert (which by then managed \$1 billion overall). They screened out companies which dealt in tobacco or alcohol, polluted the air or water, built weapons systems, discriminated against women or minorities, produced nuclear power, or did business in South Africa. That list — taken verbatim from a *Washington Post* story — sounds simple, but the screening was not. Contrary to the expectations of some Calvert staffers, the fund took off. Silby discovered that a company with good "social" indicators and solid finances made for good investments in the long run. Environmentalism, after all, breeds efficiency; fair workplaces inspire enduring loyalty. And as the Japanese have demonstrated, efficiency and loyalty lead to stable profits.

Calvert did not dramatically outperform other money-market funds, but it remained above average throughout the 1980s and built a following. It also inspired a half-dozen similar funds (the Sept-Oct 1990 **GARBAGE** analyzed most of them). More importantly for

this story, Silby found himself increasingly tapped to be an arbiter of corporate performance. When he questioned Arco's environmental-protection policies in Alaska, the oil company's chairman invited him to visit; he and his group tooled around Arco's drilling sites with the president of Alaska operations. And other leaders of social-investing funds were having similar experiences — most notably Joan Bavaria, the charismatic 45-year-old president of Franklin Research and Development, an independent Boston-based company which performed much of the research on which "social investing" companies based their decisions.

In 1989, Bavaria assembled CERES, the "Coalition for Environmentally Responsible Economies," whose 165 members were evenly divided between environmental groups, investment groups (like Wayne Silby's Calvert), and miscellaneous government agencies and economists. Significantly, the members included Elizabeth Holtzman and Gray Davis, representing two of the largest pen-

sion funds in the country: New York City and California employees. Another founding member, and co-chair along with Bavaria, was Denis Hayes,

who is best known as the organizer of Earth Day in 1970 and 1990. But Hayes is also a lawyer, and during the mid-1980s he had begun investigating the potential poverty of the pension-fund system, thinking of writing a book about it. "Then I got lured," he said recently, "into doing some legal work against sleazebags who looted and pillaged savings & loans." CERES fit not just with Earth Day, but with his other current project too — the still-under-development Green Seal rating system for products.

Bavaria had the idea that brought CERES together: creating a list of potential rules for environmentalist companies, along the lines of the Sullivan Principles for corporate investment in South Africa. Of all the people who had tried to reform institutional investing (including Peter Drucker), only the Sullivan Principles had ever seemed to have much influence on pension-plan managers. Here again, General Motors figured prominently: a black minister from Philadelphia, Leon Sullivan, had been added to the GM board after a proxy battle over



minority representation in the early 1970s. Sullivan developed his principles as a guide to fair treatment of blacks within businesses that operated in South Africa. But he later changed his mind, denounced his own principles as lacking teeth, and (working with a coalition of church investment groups) pressured many companies, including GM, to divest from South Africa entirely.

Sullivan's enlistment of large-scale investors provided an example for CERES; the Valdez oil spill provided a name. There were ten Valdez Principles in all, drafted with agreement among the CERES members (listening to Bavaria talk, I got an impression of endless telephone debates over minor wording changes). The first six principles are such standard tenets of corporate environmentalism as sustainable use of natural resources, waste reduction, "wise use" of energy, and the marketing of safe products.

But the last four principles had more — well, more teeth. Number seven suggested that after causing any ecological damage, companies would "make every effort to fully restore the environment and to compensate those persons who are adversely affected." Number eight promised to disclose any potential environmental, health, or safety hazards. Number nine promised to appoint someone representing environmental interests onto the board of directors of the company. And number ten promised an annual public audit of a company's progress.

**H**ow successful have the Valdez Principles been? Depends on how you define success. The 21 companies that have signed so far include some iconic standard-bearers of Good Business Practice: Smith and Hawken Tools, Stonyfield Yogurt, and the Aveda cosmetics company. (Ben & Jerry's ice cream company is reportedly considering signing.) Some giant companies, including such prominent large "environmentalist" firms as Du Pont, McDonald's, and General Electric,


were targeted by CERES members (notably by church groups, who by now are old hands at stock proxy battles). These companies are ruminating over the Principles. Signing would mean tremendous public-relations value (CERES encourages companies to announce that they have signed them); but corporate lawyers have worried that the Valdez compensation and disclosure clauses might give potential litigators more grounds for a lawsuit.

More significant still is the effect which the Principles might have on institutional investors. The pension-fund managers whom Wayne Silby spoke to, a year and a half ago, sat stonily through his talk. They asked if he wanted them to invest in charity projects, like subsidized housing for the homeless, and sacrifice their return on investment. But this October, the Association for Basic Management Research — a group of pension-fund analysts — held their own conference on socially conscious investing. Meanwhile, investors' resolutions at 40-odd companies will be voted on this spring, sponsored by CERES members, suggesting that GE, Du Pont, Chrysler, GTE, and others sign the Principles. Most of the proxy battles will involve institutional investors — who flexed their muscles a little bit in 1989 by forcing Exxon to add an environmentalist to their board of directors. (The funds suggested Robert Redford, Gary Hart, or Gaylord Nelson, the senator who had first suggested Earth Day. Instead, Exxon chose Dr. John H. Steele, the president and senior scientist of the Woods Hole Oceanographic Institution.)

Most of these proxy battles will probably fail; last year's Valdez Principles resolutions scored around five percent of the vote each. But Silby, Bavaria, and Hayes, each in their own way, insisted that wasn't the point. Five percent is considered a fair showing for a first-year proposal. Also, faced with the Valdez Principles, companies and industries are introducing their own codes of environ-

mental ethics, or debating such codes at top corporate levels. Some of these ethics include agreements (by Kodak, Ford, GM, Corning, American Express, Gannett) to answer CERES' intensive questionnaire. Sometimes, this represents the first time a CEO has considered his company's pollution or energy practices.

Like many of the corporate reform efforts of the past few years, the Valdez Principles will require an immense amount of data-gathering about companies. Indeed, CERES' people (while they've released their first questionnaire for corporations, in a booklet resembling an SAT exam) are still deciding what sorts of disclosure they should require from companies. Should they seek pollution-measuring numbers? Or (asks Bavaria) will numbers turn out to be as potentially misleading as budget projections have been in the financial world? (That's the unknown scandal of the "bottom line": all too often, it doesn't measure anything.) If CERES describes a company's record in words, how can they ensure that the words are fair? They'd have to standardize such evanescent forms of data before one company's good works could be measured against another's.

But no less a luminary than Peter Drucker is writing that systematic audits can be conducted — indeed, *must* be conducted — before the problems in pension-fund socialism can be resolved. Institutional investors can't make hunches: they need data. With what Drucker calls "systematic audits" of every aspect of a company's performance, they can reward those companies that actually think ahead. Environmentalists wouldn't have even been part of this reform ten years ago; now, if the Valdez Principles continue to grow in influence, they'll lead it. 

*Art Kleiner is a regular contributor to **GARBAGE** on issues pertaining to corporate environmental policies. Last year Art began working on a book called *The Age of Heretics*, to be published by Doubleday in 1992.*



*Beauty Without the Beast*



**Totally New**  
**"Totally Animal Cruelty Free"**

Exceptional body, health, beauty, home and pet care products, reasonably priced for those who care.

No animal testing, no animal ingredients  
 Biodegradable Formulas

Soaps	Lotions
Cosmetics	Shampoos
Baby Care	Room Sprays
Deodorants	Bath Therapy
Bath Bubbles	Pet Shampoos
Household Cleaners	Sports Therapy

Free Catalog  
 Call Toll-Free 1-800-748-5675, or write:

**EVERYBODY**  
 L.A.

1738 Pearl St. Boulder, CO 80302  
 303-440-0188  
 Mail Order • We ship anywhere.

# MOST AIR FILTERS ARE GARBAGE.

Most home air filters are disposable and end up in landfills. What's worse, many don't filter air effectively. But now you can replace the filter in your central air conditioning system or forced air furnace with the Air Magnet. It's a permanent filter that traps up to 96% of all the particles in the air. So clean up your environment — inside and out. Call us, right now, toll-free.




**AirMagnet**  
 CALL 1-800-743-9991 TOLL FREE

Convenient	Durable	Lightweight
------------	---------	-------------

## ECO-BAGS

COTTON STRING BAGS reusable for hundreds of shopping trips. Small enough to fit in your pocket, purse or glove compartment. Expands to the size of a standard shopping bag and holds as much too.

10 for \$39.95  
 4 for \$18.95  
 2 for \$9.95  
 (ppd, tax incl.)



Specify natural only, or assorted colors

•Excellent for fund-raising and promotional activities - call for info

To Order send check or money order to:  
 ECO-BAGS  
 Dept. G  
 PO Box 561  
 Bloomfield, CT 06002

Call 212-781-8479 Wholesale inquires welcome Fax 212-795-9007

## CAN-PACTOR

**Crush and Store Over 250 Cans For Recycling**

• Easy hand operated crusher with magne! for sorting.

• Metal storage container holds 13 gal plastic bags — drop slot for cans

• Portable — Fits conveniently in small area — 11" sq. x 24" high Weighs 17 lbs. Brown with cream top.

• No more bulky storage problems! Can-Pactor will crush and hold up to 3 times the amount of uncrushed cans.



Please make check payable to **CSL** and return with this order form to:

**\$49<sup>95</sup>**

**CSL & Associates**  
 2482 Jeff Ferry Rd., Suite 680-E16  
 Dunwoody, GA 30338

Allow 3 to 4 weeks delivery

Please send me ☐ CAN-PACTOR(s) at \$49.95 each ☐

Add 6% tax for Georgia residents: \$3.00 EACH ☐

Add \$6.00 shipping & handling EACH for Georgia residents, (\$7.50 outside Georgia) ☐

TOTAL ENCLOSED \$

NAME

ADDRESS

CITY  STATE

ZIP  PHONE

For further information (404) 396-2949

## Environmental Stocks... Growth for the 1990s

Environmental services will be the great growth industry of the decade. Hundreds of billions of dollars will be spent to clean our poisoned environment and to reduce future pollution.

**Environmental Investing News** is the monthly newsletter that covers the public companies, large and small, in this growth industry. With news of companies active in air and water pollution control, solid waste disposal, recycling, waste-to-energy, hazardous waste management and remediation, asbestos abatement, radon testing, engineering... and more. With news of technology, mergers, acquisitions, contracts, earnings...and more.

Subscribe now and save \$12 off the regular rate. No risk. You may cancel any time for a refund on un-mailed issues.

### Environmental Investing News

Robert Mitchell Associates  
 2 Cannon St., Newton, MA 02161

Please enter my subscription

☐ 1-yr special rate (US & Canada) \$96  
☐ I prefer a 3-month trial for \$36

Make check payable to Robert Mitchell Associates, Mass. residents add 5% sales tax. Foreign orders add US \$20/yr

Name

Address

City/State/Zip

CS91

## GREEN CONE™



Household kitchen waste burdens scarce landfill sites and the sewer system. Put an end to smelly garbage which attracts scavenging animals. Make glass, paper and plastic recycling more effective and pleasant!

Put a **GREEN CONE™** kitchen waste digester in your yard. It will consume all the kitchen waste generated by a family of four (even meat, fish, chicken and small bones) naturally safely and tidily without harming the environment. Odors and water are absorbed by the earth, it only needs to be opened every 2 years on average to yield a small amount of rich garden compost.

Over 85,000 owners have found the **GREEN CONE™** to be effective and convenient. Quality constructed with 60% recycled plastic. Total height 43", height above ground level 28". Five year warranty.

Send **\$99** to: Green Cone Distributors  
 PO Box 866, Menlo Park CA 94026  
 (415) 365 8637  
 (includes sales tax, shipping & handling-HI & AK add \$20)  
 24 hour order line

**1-800-955-2205** Dept. **G**  
 Visa, Mastercard, Discover, American Express

## PUT YOUR BUSINESS TO WORK FOR THE EARTH



Learn how your company can recycle, save resources, prevent pollution — and save money at the same time.

**50 SIMPLE THINGS YOUR BUSINESS CAN DO TO SAVE THE EARTH** Easy steps any owner or employee can do

From the people who brought you *50 Simple Things You Can Do To Save The Earth*

Available at your local bookstore or send \$8.50 postpaid to EarthWorks Press, Dept. G, 1400 Shattuck Ave. #25, Berkeley, CA 94709 (CA residents add sales tax)

## PAINT WITHOUT PAIN

**LIVOS NON-TOXIC PAINTS**, stains, wood preservatives, furniture polishes, waxes; children art materials, leather seal and polish.

Enjoy the beauty of earth colors made with non-toxic pigments and natural dryers. Pleasant odors from natural resins & oils.

**Low allergy reaction — NO HEADACHES!**

**FREE CATALOG:**

**LIVOS PLANTCHEMISTRY**

1365 Rufina Circle Suite GM91

Santa Fe, NM 87501 (505) 438-3448.



**PHOTOCOMM**  
**#1 In**  
**Solar Electricity**

**KYOCERA**



Ed and  
Beverly  
Paullo  
Northern  
California

Photocomm is responsible for more solar electric systems than any other American company. With systems installed throughout the United States, and thousands of satisfied customers like the Paullos, our professional staff stands ready to serve you. Contact Photocomm for all your solar electric needs.

Order our all new 1991 Design Guide and Catalog. Pay only if satisfied

Call **TOLL FREE**

**1-800-223-9580**, ext. 16-G

Or write: **PHOTOCOMM, INC.**  
Dept 16-G, 7681 E. Gray Rd.,  
Scottsdale, Arizona 85260

**T H E**  
**ENVIRONMENTALLY**  
**FRIENDLY**  
**OFFICE**

At Boyd's Office Products, we offer our customers alternatives to virgin fiber office products at **big savings**. Call today for our free catalogue packed with environmentally friendly office supplies like copier and computer papers, waste containers, storage boxes, mailing and filing supplies, and more - all made from recycled paper.

For a **FREE** catalogue call  
**Boyd's Office Products**  
**800-753-1379**

## Now, Cook With the Sun With a SolarChef Solar Oven

- Cooks, bakes, boils, and browns all foods with natural sunlight
- Costs nothing to operate
- Will cook several pounds of food at one time
- Weighs less than 19 pounds, so you can take it with you

**S**OLARCHEF, solar ovens can reach temperatures of over 350 degrees F. This lets you cook everything from golden brown bread to a six pound chicken! Foods retain their natural nutrients and flavor. On hot summer days, the SolarChef actually lowers your cooling bill by keeping heat out of the kitchen. Our complete information/order booklet will answer your questions on this fun and ecological alternative to your conventional oven and barbecue.

SolarChef: \$189 00

**YES! Enclosed is \$2.00\***  
Please send me the  
**SolarChef**

**Information Booklet**

\*Refundable with first purchase



Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_

Synchronos Design Incorporated  
PO Box 10657, Dept. G2  
Albuquerque, NM 87184

Telephone 505-897 1440





## Brush Dance — Beautiful messages and designs that connect us to each other and our earth.

★ Cards, wrapping paper and stationery on recycled paper ★ Games, books and children's art to protect the rainforest ★ (wholesale and retail available)

Write or call for our FREE 16 page color catalog.  
Brush Dance 218 Cleveland Court, Dept. G  
Mill Valley, CA 94941 (415) 389-6228

## EARTHWISE SHOPPING BAG

Over 100,000 sold!



That's right, we've shipped over 100,000 bags in 1990 alone because we offer great quality at the lowest price. Our 100% cotton canvas bags are double sewn at the seams and overstitched at the corners for ease in fitting and carrying.

Approximate size: 16" x 12" x 7"

Volume discounts and custom graphics quoted upon request.

To order, send

**\$3.99/each (\$10.99 for 3)**

Printed or unprinted

Plus \$2.95 per order shipping and handling

EARTHWISE, 13947 Five Point Road 3-G, Perrysburg, OH 43551

# NON SCENTS

100% NATURAL

Smoke • Bacterial Odor

Adsorbent

## CLEAN AIR SYSTEM

Just a few of its many uses:

- Smoke
- Pet Odors
- Autos, Trucks
- Refrigerators
- Offices
- Allergy Causing Dust & Many More!
- Mildew
- Diaper Pails
- RV's, Boats
- Freezers
- Basements

NonScents is a Zeolite, a natural volcanic mineral comprised of hydrated aluminum silicate. No chemicals or treatment or perfumes are added to NonScents.

**INTRODUCTORY OFFER.....\$24.95**

- Extra half pound FREE when you order
- Two-pound combo powder and packets
- Price includes: Tax • Shipping • Guidelines
- Money-Back Guarantee!!!

**ALSO ADSORBS TOXIC GASES**

Write or Call: Distributors needed!

*Ernest Ohl*

Independent Distributor

Dept. G1

12049 Maple Ave. • Blue Island, IL 60406  
(708) 388-7885

## SOLAR ELECTRICITY



If you are interested in knowing more about Solar Electricity, the Sunelco Planning Guide and Catalog is for you!

Packed with information and products, this eighty page planning guide and catalog details the design of RV, cabin, water-pumping and total home power systems.

Sunelco is your complete source for solar modules, controllers, batteries, inverters, water pumps, and propane appliances.

still only  
**\$3.95**

**Sunelco**

THE SUN ELECTRIC COMPANY

1-800-338-6844

**SOLAREX**

Authorized Distributor

Rush me your Sunelco Planning Guide and Catalog.

I'm enclosing \$3.95. Mail to:

Sunelco, P.O. Box 1499 G11, Hamilton, MT 59840

Name \_\_\_\_\_

Address \_\_\_\_\_

Zip \_\_\_\_\_

\$6.00 out of USA

## FOR WOMEN ONLY THE KEEPER™

THE SAFE SMALL INTERNALLY WORN REUSABLE SOFT RUBBER MENSTRUAL CUP IS SIMPLE TO USE. IT'S COMFORTABLE, ECONOMICAL. THE KEEPER HAS A LIFE EXPECTANCY OF AT LEAST 10 YEARS.

A NEW SIZE IS NOW AVAILABLE

(PLEASE INDICATE WHICH STYLE WHEN ORDERING)

☐ STYLE A  
After Childbirth

☐ STYLE B  
Before Childbirth



(YES, LADIES, YOU FOLD IT LENGTHWISE BEFORE INSERTING.)

THREE MONTH MONEY BACK GUARANTEE

**\$35.00 PLUS \$2.00 SHIPPING & HANDLING COMPARE OTHER PRODUCTS AT \$2.00/MONTH X 10 YEARS = \$240.00**

**BE KIND TO YOURSELF, YOUR POCKETBOOK AND THE ENVIRONMENT. ORDER ONE TODAY.**

FDA ACCEPTED (FDA DOES NOT "APPROVE" OF ANY PRODUCT. IT ONLY ACCEPTS OR REJECTS.)

**THE KEEPER™ ...the lady's companion**  
BOX 20023G, CINCINNATI, OH 45220 USA

"ENVIRONMENT-FRIENDLY"

"USER-FRIENDLY"



Products Services Technologies for a Healthy Environment

**Tour de Sol Earth Fair**  
Products, Services and Technologies  
For a Healthy Environment

New England's first cutting edge event promoting Alternative Energy Technologies and Environmentally Friendly Products and Services for the Home, Office and Community.

**May 25th and 26th, Cordage Park  
Plymouth, Massachusetts**

Educational Exhibits and Displays, 50+ Solar and Electric Vehicles, Workshops, Demonstrations and Entertainment. A Benefit for the American Tour de Sol, Solar and Electric Car Championship.

For more information, contact:  
**Earth Rising Productions, Inc.**  
P.O. Box 1078  
Boston, MA 02272  
(617) 489-4890



# Tires & People, Tally-Oh

## OLD TIRES, NEW TIRES

For 35,000-mile tire, money saved buying a retread:  
**30 to 30%**

Petroleum saved: **4.5 gallons**

Number of tires retreaded in 1990:

**33 to 34 million**

Petroleum saved:  
**400 million gallons**

Volume of roadside rubber (tire litter) left by trucks:  
**nearly 100%**

Volume of roadside rubber from new truck tires:  
**50%**

Volume of drivers whose tires are underinflated:  
**25 to 50%**

Gas saved if all tires were properly inflated:  
**up to 4 million gallons/year**

Source: Tire Retread Information Bureau; U.S. DOE

## BIG TIRES, LITTLE TIRES

Ratio of bicycles to autos, 1988

CHINA  
**250:1**

INDIA  
**30:1**

SOUTH KOREA  
**20:1**

MEXICO  
**2.5:1**

NETHERLANDS  
**2.2:1**

JAPAN  
**2:1**

AUSTRALIA  
**1:1**

UNITED STATES  
**0.7:1**

Source: Worldwatch

## FUN FACTS

Length of City of San Antonio's  
Highway 90 to GARBAGE  
7 pages

Length of City of San Antonio's  
Highway 90 to GARBAGE  
7 pages

## WHERE WE ARE

Percent of U.S. population...

In the city:

In the country:

**15.3**      **1850**      **84.7**

**39.6**      **1900**      **60.4**

**64.0**      **1950**      **36.0**

**72.8**      **1989**      **27.2**

Source: U.S. Census Bureau

## POPULATION & PENNIES

Federal funds for the Family Planning Program, 1971 through 1973:  
**\$162 million**

Unwanted pregnancies, 1973: **14.3%**

Federal funds for the Family Planning Program, 1980 through 1982:  
**\$448 million**

Unwanted pregnancies, 1982: **7.7%**

Federal funds for the Family Planning Program, 1986 through 1988: **\$421 million**

Unwanted pregnancies, 1988: **10.3%**

Federal funds for the Family Planning Program, 1989 to 1991: **\$415.5**

Unwanted pregnancies, 1991: **as yet unknown**

Family planning clinics in U.S., 1981: **5,000**

Family planning clinics in U.S., 1989: **4,000**

Source: Planned Parenthood; Zero Population Growth



## Bat Condos, Mouse Chalets, and the Garden Doctor

### PRODUCTS

#### Bat Condos

It's springtime, and as they have since time immemorial, mosquitoes are whining up out of the marshes, inflicting red welts on all creatures great and small.

Past tactics for battling the whining menace were to pour diesel oil into swamps to suffocate the mosquito larvae, or to spray with DDT. Despite finely tuned biological weapons now proving effective, the bad old days aren't completely gone. When mosquito-borne Eastern equine encephalitis — a disease fatal to horses and people alike — turned up in southeastern Massachusetts last summer, the state resorted to spraying 800,000 acres with the potent and controversial pesticide malathion. (Organic gardeners were given large balloons to make their properties visible from the air.)

If you're under mosquito siege and you don't want to call the local crop duster, one of the hardest-working natural enemies of the mosquito is that nocturnal winged wonder, the bat. The common little brown bat, who weighs just half an ounce, is capable of nipping 600 mosquitoes an hour from the night sky. Bats and rabies are often mentioned in the same alarmed breath. However, each year family pets cause more deaths than have bats during the past 40 years.

You may be able to lure bats closer to your home by putting up a bat house. Bats that aren't settled happily in a tree (or your attic) will consider the invitation, as long as food (mosquitoes, moths, and other night-fliers) and water (they may settle for a swimming pool) are nearby. You'll get fewer mosquitoes and the bats will get good habitat — something that Bat Conservation International says is dwindling

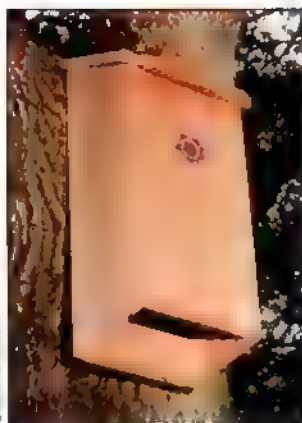
Bat condos, as they're sometimes called, can be nailed to a tree or a wall, from 12 to 15 feet above the ground. The bats scoot in from the bottom, and sleep hanging from roughened wood partitions that are spaced from 3/4 to 1-1/2 inches apart.

Bat houses may be available locally through a nature center. Bat information, houses, and house-construction plans are available by mail from Bat Conservation International, P.O. Box 162603, Dept. GM, Austin, TX 78716; (512) 327-9721. Plans: \$2.25 ppd. Houses: single-chamber (holds 25 or more bats), \$36.95 ppd; four-chamber (50 or more bats), \$51.45 ppd.

#### Mouse Chalets

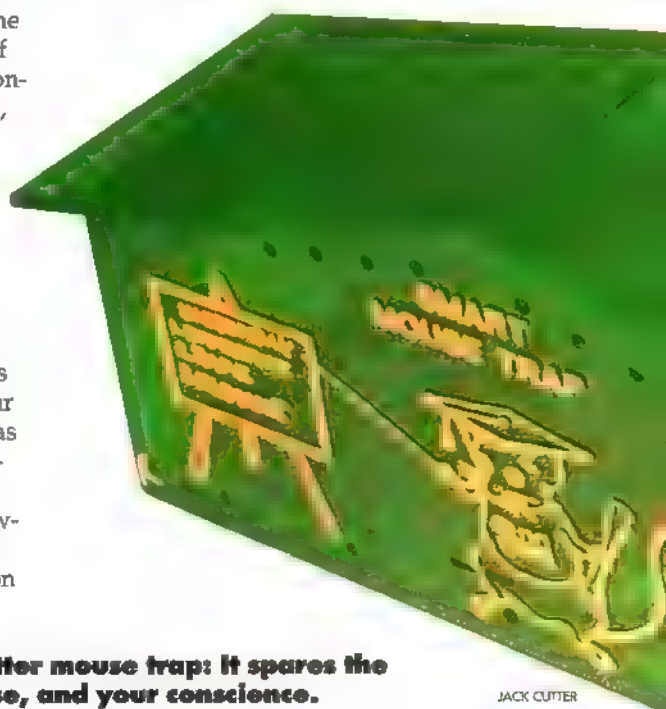
Mice. So cute. Such a pain. Even getting rid of them is painful, and not just for the mouse. People, too, feel pangs when they hear the SNAP! of a trap or the rustle of the little furry ones stuck to a glue board.

The Smart Mouse Trap is, I suppose, sappy



MERIND D. TUTTLE

**Give bats a home, and they'll keep mosquitoes on the fly.**



**A better mouse trap: It spares the mouse, and your conscience.**

JACK CUTLER

as products go, but it's also clever. It's sort of a Swiss chalet in green or red translucent plastic with a spring-loaded door, and a mouse-proof slot for a cracker. When Mr. Mouse crosses the threshold to sniff at the cracker, the door snaps shut, and he's held prisoner. Unlike a wire live-trap, the Smart Mouse Trap has no holes in which mouse-feet or kid-fingers can get stuck. (Breathing holes prevent him from suffocating.)

When you wake to find a rancorous rodent in the chalet, the manufacturers urge you to introduce it to your children, thus instilling in them a love of nature. (The mouse probably won't express much enthusiasm, so keep it brief.) Find a spot for the release, and open the "freedom door," exposing cracker to mouse for the first time. Stand by for the joyful experience promised in the product brochure — the mouse eating his way to liberty.

In the pamphlet, an invisible benefactor of mice says "we just want him out of our home and back in the woods where he belongs." The mouse has other ideas. The woods are full of bad weather and predators. Your house, on the other hand, offers bacon fat, corn chups, and central heating.



Unless you take him a fair distance into the woods, or release him in your neighbor's kitchen, he may hustle right back to where the livin' is easy. But maybe you'll gain enough time to locate and plug his entrance.

From Seabright, \$12.50 ppd., 4026 Harlan St., Dept. GM, Emeryville, CA 94608-3604; (800) 284-7363.

### Yogurt Maker

It's the curse of the New-Age generation: They decided on a healthy, minimal-meat diet, only to discover that yogurt always comes in a heavy-duty plastic container. Being too Earth-conscious to throw the tubs in the trash, members of the yogurt generation are easy to spot after a look into their cabinets: stacks of plastic containers waiting for a use.

The Deva Bridge yogurt maker will put those stashed containers back into use, and keep you from buying more of them. A sleek, super-insulated tub, it requires only boiled milk and a tablespoon of starter to turn out a quart of fresh yogurt. The type of milk (skim, low-fat, or whole) is up to you, as is the starter — pick a favorite brand that contains active cultures (look on the label). As long as you don't let a batch go bad, and if you remember to leave a tablespoon over for the new batch, you'll never need to buy yogurt again.

With the tub comes a thermometer (yogurt cultures multiply only under optimal temperatures) and a ceramic disc that prevents milk from burning as it boils. (Cheese-lovers with cholesterol worries should inquire about the companion soft-cheese maker, which can turn non-fat yogurt into a sort of farmer's cheese.)

To order a Deva Bridge yogurt maker, send \$31.50 to Walnut Acres, Dept. GM, Penns Creek, PA 17862; (800) 433-3998.



**Make fresh yogurt, and less garbage, with the Deva Bridge yogurt maker.**

## BUY IT NAKED

*Purchase Responsibly Packaged Goods*

© Wordly Wise • P.O. Box 9715-221 Portland, ME 04104. The information on Wordly Wise is not for sale.

**To order this bumpersticker, send \$1.25 to Wordly Wise, P.O. Box 9715-221, Dept. GM, Portland, ME 04104.**



RESOURCES

**The Garden Doctor**

1684 Willow, Denver, CO 80220. Quarterly. \$18.

It defies description, but here's a go: It's a collection of garden-related ... no, environment-related ... no, unrelated tidbits of what might (in the right circles) pass for wisdom. It's a magazine-shaped magazinelette that looks like it's printed by Fred's Copy Shop. Inside is a smorgasbord of opinion, how-to advice, scientific fact, and zany graphics, presented with what appears to be the scissors-and-photocopier system of art direction.

But the earnest art staff is augmented with people who traditionally have a hard time finding employment. Retarded adults use magic markers to color a headline here and a photo there.

*The Garden Doctor* is rife with articles ... or columns? ... let's just say, words. A recent "Shared Secrets" column covered such delightfully unrelated topics as how to make a mosquito trap; why birds like peanut butter;

and how hens can solve pest problems. In "Toddler Fodder," parents are given a science project to do with their children (like sprouting seeds on a sponge farm). Another article, for adults, delves deep into sprouting — what seeds make good sprouts, when to harvest them, and how they taste.

Besides the crazy collection of useful knowledge, there are essays, poems (not as gruesome as I feared), and anecdotes. The December 1990 issue offers thoughts on enjoying the long, dark, (depressing) days of winter, the composition of honey, the charm of clotheslines, and Italian herbs. And each issue comes with three packets of home-grown seeds. Buried in the magazine are instructions for planting.

Throughout the two-dozen pages are etchings of animals and plants, quotes-from-the-blue (*I had a pleasant time with my mind, for it was happy.* Louisa M. Alcott), and stray facts (*In 1978 a carrot weighing 15 pounds 7 ounces was grown by Ms. I.G. Scott of Nelson, New Zealand.* — Guinness Book of World Records).

A more jubilant publication has not come my way in a long while.

**MR. RUMPLES RECYCLES**

Written and illustrated by Barbara Anne Coltharpe

A delightful storybook that teaches children how to recycle at home and school. Entertaining and imaginative, the story introduces Mr. Rumples, the neighborhood enigma, and three children who have long been curious of his strange ways. In addition to learning that older people are fascinating without being fearsome, children learn about recycling household and yard wastes.

A subject of global concern, author-illustrator Coltharpe projects the vital matter of recycling in a manner to grasp a child's interest and attention. Parents, teachers and children love this book. Aimed at ensuring the Earth's future and instilling healthy, lifelong habits, Mr. Rumples Recycles is a must for every child.

"Perfect for kids K-6" *Garbage Magazine*

Chosen as award presentation by *Family Circle*.

Please prepay. Other quotes on request.

**Specifications:** Soft cover, 8 full color/22 black and white illustrations, 8 1/2" X 11", 30 pages.

**ORDER FORM** (Enclose check or money order)

**Hyalinth House Publishing**

Post Office Box 14603

Baton Rouge, LA 70898

(504) 787-8717

Send \_\_\_\_\_ copies of Mr. Rumples Recycles  
\$6.50 @ (includes shipping costs). Canada \$7.50

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone ( ) \_\_\_\_\_



**LIQUIDATION SALE**

3 Color Print on White

100% Cotton

Sizes Available: Adult - SML, MED, LG, XLG

**WAS \$12.99 NOW \$7.99**  
(Enclose check or money order)

Mail To:

**BETTER WORLD T-SHIRTS**

#1 Innwood Cr. Ste. 220

Little Rock, AR 72211

No. of Shirts ordered \_\_\_\_\_ X 12 99 = \_\_\_\_\_

Sizes SML \_\_\_\_\_ MED \_\_\_\_\_ LG \_\_\_\_\_ XLG \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone ( ) \_\_\_\_\_

**THE SMART TOP™**



An innovative new product which converts standard trash cans into recycling containers for under \$20.

Perfect for home, office, schools, restaurants, hotels or other institutions.

**PAPER PLUS RECYCLING, INC.**  
504 Malcolm Ave SE, Minneapolis MN 55414



**Call for Free Brochure**  
**(612) 378-1374**

© 1991, PPR, Inc., Patent Pending

## SmartSac™ ...The intelligent choice

Introducing SmartSac™ bags. 100% recyclable woven, coated polypropylene, they're lightweight, yet strong enough for all your carrying needs. SmartSac™ bags are stain resistant and washable.

- ♦ **Smarter than canvas:** Our material is FDA accepted...it does not support bacterial growth.
- ♦ **Smarter than string:** SmartSac™ bags stand up for easy loading and are moisture proof...with no spaces to lose small items.
- ♦ **SmartSac™ marketers** are 13" L x 7" W x 18" D and hold more than 2 brown paper grocery bags. A super, all purpose tote!
- 2 / \$17<sup>95</sup>, 4 / \$27<sup>95</sup>, 6 / \$37<sup>95</sup> postpaid
- ♦ **SmartSac™ recyclers** are 36" D x 15" in diameter. 30 gallon capacity for recyclables, dry household trash, clothing, etc. Locking drawstring.
- 2 / \$24<sup>95</sup>, 4 / \$39<sup>95</sup> postpaid

Send order with name, address, phone and check or money order to:  
 Personal Statements, Dept. G, P.O. Box 576, Merrimack, NH 03054  
 or call 1-800-444-7891 (Visa-M/C orders only). In NH (603) 424-8650.  
 Satisfaction Guaranteed!

**FREE BONUS OFFER**  
 for readers of  
**GARBAGE**  
 Call Now—Offer  
 Expires 6-30-91

## 800 NEEDS

National Ecological and Environmental Delivery System

**N.E.E.D.S. - THE LARGEST SUPPLIER OF PRODUCTS FOR THE CHEMICALLY SENSITIVE AND ENVIRONMENTALLY AWARE. PLEASE WRITE OR CALL FOR FREE CATALOG.**

527 CHARLES AVENUE • SYRACUSE, NEW YORK 13209 • Call Toll Free: 800-634-1380

## ATTENTION RETAILERS!

Sell **GARBAGE** in your store!  
 Just return the attached coupon and we'll send you information on how to set up an account. For faster service call

**ONE DOLLAR**

508-283-4721. Favorable discounts are available.

Mail to:  
**GARBAGE**  
 Attn: Direct Sales  
 123 Main St. Gloucester, MA 01930

NAME \_\_\_\_\_  
 COMPANY NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_  
 STATE \_\_\_\_\_ ZIP \_\_\_\_\_

## PLAY EARTHWORD™

An Environmental GAME

- Learn about air, water, forests, animals, global warming, oceans, health, recycling and other issues.
- Simple directions. Play right away.
- 800 intriguing questions.
- The ideal gift for the '90's.
- Educational fun for family/friends.
- Challenging multiple choice format.
- Can be played *anywhere*.
- Printed on *recycled* paper.

Please send me **EARTHWORD™**.  
 Enclosed is a check or money order for \$19.95 plus \$3.50 for shipping & hndlg.  
 NJ residents add 7% sales tax (\$1.40).

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_  
 State \_\_\_\_\_ Zip \_\_\_\_\_

Mail to: **EARTHWORD Inc.**, Dept. G.  
 104 Church Street, Keyport, NJ 07735  
 Please allow 3 to 4 weeks for delivery.

## WATERSAVING TOILETS

We offer a selection of the finest quality ultra-low-flush toilets. All use only one to one-and-one half gallons per flush, yet work better than many standard toilets that use three to five gallons. They will reduce stress on wells and septic systems and can dramatically lower water and sewer costs. Installation measurements are standard.



## RUBBER ROOFING

Our revolutionary new EPDM rubber roofing system offers reliable, safe, and environmentally friendly waterproofing for flat roofs. We will custom fabricate a single sheet that you simply screw in place through flaps on the underside, so that none of the screws pierces the sheet! If a deck is to be built on top, the sheet can just be laid in place without any fasteners. We also fabricate custom Butyl sheets for garden ponds, planter boxes, and shower liners.



## ACRYLIC ROOFING

Our acrylic roof system is a paint-on, elastomeric coating that can permanently repair leaking asphalt and metal roofs. It is water-based and non-toxic, and is easy to apply and repair. We offer a variety of architectural colors, including a bright white that will reduce summer cooling costs.



## BUILDING GASKETS

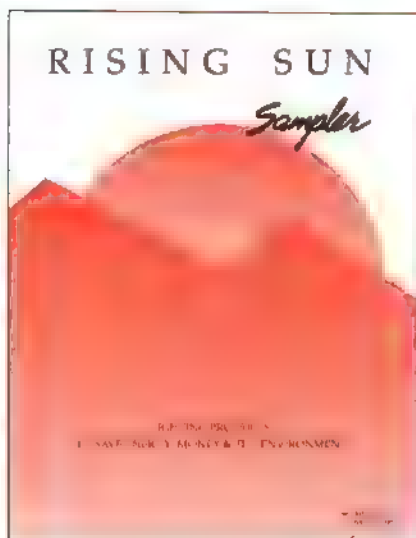
Our Swedish building gaskets make it feasible to build energy-efficient houses without the use of spray foams. We offer designs for mud sills, wall plates, drywall seals, stress-skin panels, log joints, window framing, and glazing.



We offer the nation's most comprehensive selection of state-of-the-art technology for energy, water, and soil conservation in residential building, including vapor-barrier films, weatherstripping, ventilation systems, radon-control products, drainage products, sun-control products, and much more.

**RESOURCE CONSERVATION TECHNOLOGY, INC.**  
 2633 NORTH CALVERT STREET  
 BALTIMORE, MD 21218  
 (301) 366-1146





### Rising Sun Sampler fluorescent-light catalog

Rising Sun Enterprises, Inc., Box 1728, Basalt, CO 81621; (303) 927-8051. \$5 ppd.

Fluorescent lights have become one of the enigmas of the green revolution. While every "10 ways to save the Earth" brochure, book, and newspaper column includes an entry urging people to dump incandescent bulbs and screw in fluorescents, these bulbs are dogged by worrisome questions. Rumors of radioactive elements, mercury, and electromagnetic radiation refuse to die. Such dark topics cloud the bulbs' bright green image.

The Rising Sun Sampler, a catalog of low-energy lighting products, answers 19 common questions about compact fluorescent lighting: What happens to the mercury? Do all bulbs contain radioactive elements? How can you maximize a bulb's life?

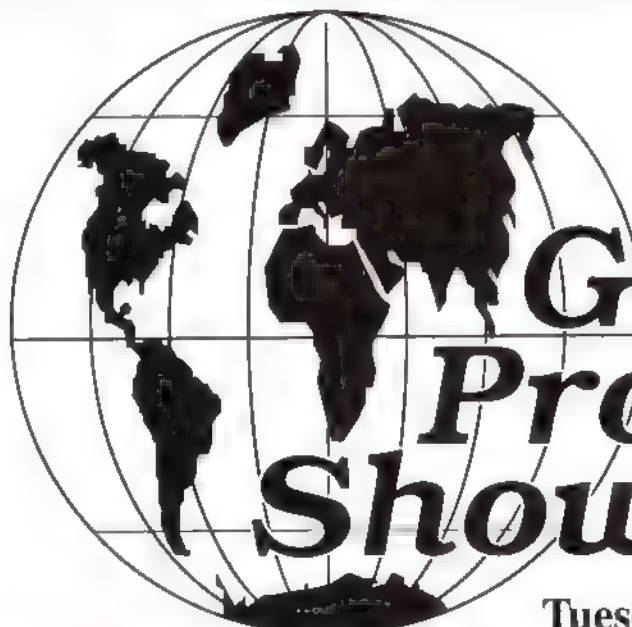
The tone of the answers conveys a predictable bias, but the hard information is there for

those who want to make up their own minds. For example, while the authors concede that mercury in fluorescent bulbs presents an environmental problem, they argue that if all our lights were incandescent, the increased energy demand would release 300 additional tons of mercury. In other words, environmental problems have no perfect solutions.

The body of the catalog presents a wide range of bulbs, floodlights, accessories, and indoor and outdoor fixtures available by mail order. Included is a *Consumer Reports*-style chart that rates all the bulbs for equivalence to incandescent bulbs, power consumption, avoided energy cost and CO<sub>2</sub> emissions, appropriate uses, and temperature tolerance.

My only beef with Rising Sun lies in the answer regarding radioactivity. The authors state that only "certain" compact-fluorescent core-coil ballasts (the bulb's "engine") contain radioactive elements. Fact is, every compact core-coil ballast that screws into a normal fixture has radioactive elements. (Electronic-ballast bulbs don't use radioactive elements.)

This catalog will enable you to choose intelligently among the imperfect solutions.



**Making its debut ...The first  
and only Trade Show for the  
burgeoning environmental  
products field**

# Green Products Showcase

**Tuesday thru Thursday • August 6-8, 1991  
Tropicana Hotel • Las Vegas, Nevada**



**Special Room Rate  
for Exhibitors & Buyers  
Just \$59 Single or Double**

*For reservations, call the Tropicana  
directly at (800) 634-4000*

**Produced by:**



**Marketed by:**



**(213)  
455-0075  
FAX (213)  
455-2551**

EXTRA Special Videos from Children's  
Television Workshop & 3-2-1 Contact!

# THE ROTTEN TRUTH

**The Rotten Truth.** A new kind of trash TV brings kids a fresh look at the facts about garbage and the 2R's — Recycling and Reduction. A 30-minute 3-2-1 Contact Extra. \$17.45.

YOU CAN'T GROW

# HOME AGAIN

**You Can't Grow Home Again.** A special journey takes kids face-to-face with the beauty of rainforests and the threats to their survival. A 60-minute 3-2-1 Contact Extra. \$23.45.

To order:

Call 1-800-822-1105 — Operator #12 (Credit Cards Only)  
Or send Checks or Money Orders for the Full Cover Price\* to:

VCA-TRT/YCGHA  
50 Leyland Drive  
Leonia, NJ 07605

\*NY and NJ residents, please add sales tax.

# neo sac ... the pocket tote!

- compact—4 1/2" x 5" nylon wallet unzips to accommodate grocery-bag loads!
- strong—sturdy nylon construction; made in the USA
- thousands sold nationally
- assorted colors
- prices: \$14 each; two for \$26 (US shipping included)



opens to 13 1/2" x 12" x 7"

Available from: The Markusen Group, Inc., • PO Box 70373 • Seattle, WA 98107 • (206) 435-6609

neo sac®

## HERE'S YOUR CHANCE TO REDUCE WASTE!

- No more soda bottles to throw away when you make your own sparkling soda.
- 60 liters of soda per refill - only 15¢ per liter!
- Make your favorites: Coke, Pepsi, 7-Up etc. Also available: sugar free fruit essences and natural fruit concentrates (No artificial preservatives or flavorings).
- Call for information on our new SpritzIt™ Siphon System and other packaging saving appliances - yogurt maker, cream whipper etc.

Globus Mercatus Inc.  
PO Box 1565, Cranford, NJ 07016  
1-800-NATURE-1



Drink Maker: \$149.00 + \$5.00 S/H

# WHAT WILL NOT FADE AWAY, DECAY, POLLUTE THE AIR, WATER OR LAND, AND IS 100% RECYCLABLE? MUSIC.

**Relix Magazine** - writing about  
Bay Rock and Alternative Music for 18 years.  
Featuring music we can all like!

## TRY US!

**SURE!** I'll try some Relix, send me a subscription!

- ☐ 6 issues \$23.00  
☐ 12 issues \$45.00  
☐ How about a T-shirt  
and 6-issue  
subscription? \$35.00

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City and State \_\_\_\_\_  
Zip \_\_\_\_\_ Phone # \_\_\_\_\_



Send your check to:  
**RELIX MAGAZINE**  
P.O. BOX 94G  
BROOKLYN, NY 11229

**STORE OWNERS:**  
Want to try Relix in your store?  
Write to us for complete details!



# Products for Chemically Sensitive and Environmentally Aware

HOME AND INDUSTRIAL

NOT TESTED  
ON ANIMALS



- Paints
- Enamels
- Stains
- Mildew Control
- Cleaners
- Carpet Guard
- Sealers
- Shampoo
- Wax

Solutions • Arcata, CA • (707) 822-6872  
Environmental Outfitter • New Canaan, CT • (203) 966-3541  
Larry Carroll • Hillsborough, NC • (919) 732-8454  
Ecosentials • Brattleboro, VT • (802) 257-9377  
Paula Lohmann • Vienna, VA • (703) 281-7728  
Nigra Enterprises • Agoura, CA • (818) 889-6877  
ET&T • Encinitas, CA • (619) 436-5990  
Cordaro-Colgrove • N. Hollywood, CA • (818) 766-5523  
Baubiologie Hardware • Pacific Grove, CA • (408) 372-8626  
Solutions to Indoor Pollution • San Diego, CA • (619) 271-8082  
Pete Folsum • Santa Barbara, CA • (805) 965-2680  
The Allergy Store • Sebastopol, CA • (707) 823-6202  
Pure Health Concepts • Smyrna, GA • (404) 859-9040  
Johnson Allergy Supply • Louisville, KY • (502) 966-0003  
Nacul Products & Resources • Amherst, MA • (413) 258-8025  
The Home Zone • Grand Haven MI • (616) 847-0286  
Eco Choice • Montvale, NJ • (201) 930-9046  
Fine Additions • Santa Fe, NM • (505) 471-4549  
A Better Way • Foscoe, NC • (704) 963-5806  
Nontoxic Environments • Corvallis, OR • (503) 745-7838

The Living Source • Waco, TX • (817) 756-6341  
Eco Logic • Crestline, CA • (714) 338-5694  
White Dolphin • Eureka, CA • (704) 445-2094  
Nontoxic Alternatives • Orinda, CA • (415) 376-6998  
S & D Distributors • Riverside, CA • (714) 781-5860  
Ecology House • Santa Barbara, CA • (805) 967-9200  
Environmental Concerns • Sebastopol, CA • (707) 829-7957  
Bill Farrar • Lilburn, CA • (404) 921-5495  
Hanaier Natural Food Store • Hanaier, MA • (808) 826-9586  
For Your Health Products • Chevy Chase, MD • (301) 654-1127  
The Ecology Box • Ann Arbor, MI • (313) 662-9131  
Blumberg's Natural Food • Plymouth, MN • (612) 553-9781  
Bloom's Eco Consultants • Santa Fe, NM • (505) 986-9222  
NEEDS • Syracuse, NY • (315) 488-6300  
The Allergy Assistance • Lumberton, NC • (919) 739-4477  
Allergy Relief Shop • Knoxville, TN • (615) 522-2795  
Flownight • Issaquah, WA • (206) 392-8357  
CANADA: David Cardella • Vancouver, BC • (604) 649-2721  
Steward's Green Line • Vancouver, BC • (604) 872-5498  
Kathy Young • Victoria, BC • (604) 384-8892



FOR TECHNICAL INFORMATION  
**AFM Enterprise, Inc.**

Custom Formulating  
Manufacturing

1140 Stacy Court • Riverside, CA 92507 • (714) 781-6860 • (714) 781-6861

## Powerless?

Beat the high cost of energy with  
our rock-bottom prices on :

- Solar-electric
- Energy saving lighting
- Solar battery chargers
- Tankless water heaters
- Solar waterpumping
- Composting toilets
- Solar hot water

**INTEGRAL  
ENERGY  
SYSTEMS**



Send \$5.00 (refundable) for our  
105 page design manual & catalog  
**Integral Energy Systems**  
105-G Argall Way  
Nevada City, CA 95959  
(800) 735-6790  
Mastercard & VISA accepted.

## The Original French String Bag

2 for \$8.00 (postage included).

A variety of colors.  
Assorted sizes.  
100% cotton.  
Retail & Wholesale.



The Environmental Bag Co.  
P O Box 786, Pt. Jeff., NY 11777  
(516) 473-5064

## EARTH KIT™ Beginner's Active Environmental Kit

Excellent Birthday or Post  
Earth Day Gift to Motivate  
both Adults and Children  
Send \$29.95 + \$5 s/h to:  
(or Request more info from)

**EARTH KIT**  
P.O. Box 7059  
Nashua, NH 03060



## Women's Choice

Non-Disposable  
Menstrual Pads  
and Pantie-Liners

- 100% cotton fleece
- Waterproof backing
- Fasten with velcro

Made In Canada by Women's Choice

PO Box 245 Gabriola, BC  
Canada V0R 1X0 (604) 247-8433



## BAT HOUSE

"Bat Condominium" houses  
30 to 50 bats, each eating thou-  
sands of mosquitoes a day.  
Safe to humans and environ-  
ment. Provides habitat for  
endangered species as well. Constructed to last. In-  
structions, bat info. included.

Portion of proceeds to Bat Conser-  
vation Int'l. Dealer inquiries welcome.  
**FREE CATALOG** of Bat and  
Bird Habitats, Feeders

**\$29.95**  
plus \$5 p/h  
(ME add \$1.50  
tax)

Coveside Conservation  
Products

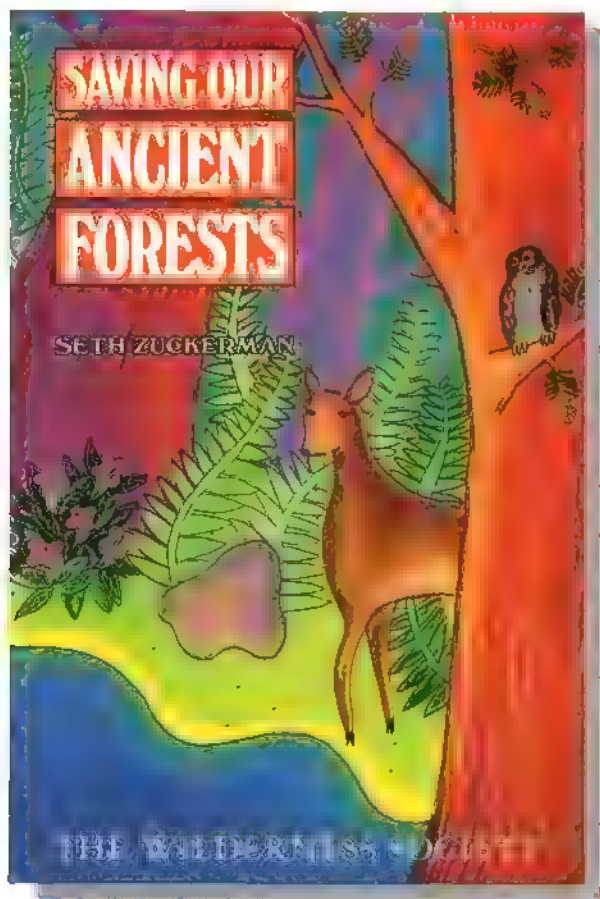
P.O. Box 417G 1-800-326-2807  
Georgetown, ME 04548 Visa/MC

## Start Your Own BUSINESS!

We Sell an Environmental  
Product Developed in  
**BIOSPHERE 2**  
I'll show you how

CALL  
**1-800  
256-3211**

# You Can Help Save America's Ancient Forests



**S**aving Our Ancient Forests, richly illustrated and easy to read, tells the story of these endangered forests and provides practical information about simple steps you can take to help save this uniquely American treasure.

Brought to you by The Wilderness Society, this new family-oriented handbook transports you to a majestic world where giant trees tower above one of nature's oldest, rarest . . . and most rapidly disappearing ecosystems.

It's the perfect tool for helping you and your children learn why and how these magnificent forests and the wildlife that depends on them should be saved and protected for future generations.

With every purchase, we will include a FREE Citizen's Action Kit, which supplies you with everything you need to make your voice heard by the President, the U.S. Forest Service, the timber industry, and Congress.

**Only \$5.95**

All proceeds from sales of the book and associated products go directly to The Wilderness Society's efforts to protect these forests and other endangered wildlands.

## OTHER GREAT GIFTS FOR YOU AND YOUR CHILDREN

For bulk orders  
call The Society at  
(202) 833-2300

**Color the Ancient Forest**  
This delightful coloring book will introduce your children to the wonders of our Ancient Forests.  
48 pp.; **\$4.95**

**Save the Ancient Forests T-Shirt**  
Display your commitment to our Ancient Forests with this T-shirt, available in small, medium, large, extra-large; **\$14.95**

**Ancient Forest Tote-Bag**  
Help save our forests by using this colorful, sturdy, full-sized tote-bag for carrying groceries.  
17" x 12" x 7"; **\$12.95**

The Wilderness Society is a not-for-profit conservation organization.

### ORDERING INSTRUCTIONS

Quantity	Price	Total
— <b>Saving Our Ancient Forests</b>	<b>\$5.95</b>	_____
— <b>Color the Ancient Forest</b>	<b>\$4.95</b>	_____
— <b>Ancient Forest Tote-Bag</b>	<b>\$12.95</b>	_____
— <b>Ancient Forest T-Shirt</b>	<b>\$14.95</b>	_____
(please indicate size(s))	Sub-total	_____
	Sales tax	_____
	Shipping & Handling	_____
	Total Enclosed	_____

Please allow 6-8 weeks  
for delivery.

Shipping and handling charges:  
Orders under \$15, add \$3.50; orders \$15 and over,  
add \$4.50. Maryland residents add 5% sales tax.

**YES. I want to learn about America's Ancient Forests and how I can help save them.**

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_

ZIP \_\_\_\_\_

Mail this coupon and your check or money order to:

**THE WILDERNESS SOCIETY**  
P.O. Box 296, Federalsburg, Maryland  
21632-0296

GBMJ1



## Here are company catalogs and brochures worth writing for. The Request Form gives you a handy way to get as many catalogs as you need — just by filling out one form.

**4. Electricity From Sunlight** — A great source of power for remote homes, boats, and RV's. Sunlight reaching the solar module is instantly converted to DC electricity. Catalog and design guide, \$3.25. **Alternative Energy Engineering.**

**5. Recycled Acid-Free Papers** — A complete selection of the finest recycled papers available in many finishes. Free samples available to trade and business customers only. **Cross-Pointe.**

**6. Office Recycling** — Complete systems for office recycling from desk to dock. Unique combination of products and educational materials assist offices in efficient internal recycling. Deskside paper collection files, intermediate containers. Brochure, 75¢. **Diversified Recycling Systems.**

**10. America's Garbage Crisis** — This fascinating text explores how we cope with the abundance of trash that is quickly swallowing our land and polluting our air. "Rush to Burn", 276 pages, is available in paper or cloth. Free 48-page catalog. **Island Press.**

**14. Products for a Healthy Planet** — This 50 page catalog features products and information for a healthy planet. The wide variety of products ranges from recycled paper to toilet dams. Free catalog. **Seventh Generation.**

**22. Invest For Social Change** — This large socially responsible money market fund believes that whenever your capital is at work it should benefit and protect the rights of people everywhere. Free literature. **Working Assets Funding Service.**

**34. Energy Saving Products** — Solar-electric, super-efficient lighting, tankless water heaters, composting toilets, recycled paper products, water saving appliances. Guaranteed lowest prices in USA. Free 104-page catalog. **Real Goods.**

**36. Solar Electricity** — This planning guide and catalog is packed with 40 pages of information and quality products. A complete source for solar modules, controllers, batteries, inverters, water pumps, and propane appliances, \$4.20. **Sunelco.**

**41. For Ecotists Only** — Dozens of planet-saving items! New ideas in recycled paper and plastic, unique mugs, wearables, books, tapes, and much more. Wholesale pricing available. Catalog, \$1.75. **Signs & Symbols.**

**44. Economical Canvas Bags** — Low cost, high quality, 100% cotton canvas bags. Samples provided for commercial accounts/organizations requesting via letterhead: 13947 Five Point Rd., Perrysburg OH 43551. Free literature. **Earthwise.**

**53. The AQ Plus+™** — A counterflow heat exchanger which eliminates indoor air pollutants and allergens. Unit continuously filters the room air while exhausting a portion of it and supplying fresh air. Free literature. **Berner Air Products, Inc.**

**57. Beautiful, Useful Products** — This company offers products that renew our environment such as recycled stationery. They also offer alternatives to styrofoam cups. Free brochure. **Brush Dance.**

**63. Teacher's Materials** — 3-2-1 CONTACT has developed Teacher's Guides and a computer data base to help teachers use it in the classroom. Free brochure. **Children's Television Workshop.**

**65. Clean Air Act 1990** — An appraisal of the market opportunities created by this landmark legislation from an investor's perspective. Free report. **Robert Mitchell Associates.**

**66. Recycled Paper** — Copy, printing and computer paper, paper towels, napkins and facial tissue. Our new item is unbleached toilet paper made from 100% post-consumer waste-paper! Catalog, \$1.25. **Atlantic Recycled Paper Co.**

**73. Fundraising Resources** — Promote environmental awareness and action with items such as colorful T-shirts, buttons, rubberstamps, and much more. Free catalog available. **Environmental Resource Project.**

**76. Environmentally Save Bags** — Canvas shopping totes, canvas lunch bags, mesh produce totes, cotton drawstring bags, and European-style string bags. Every time you use these products, you help our environment. Free brochure. **TreeKeepers.**

**81. Clothing & Sportswear** — A complete line of technical clothing, layering systems, and sportswear. Free color catalog available. **Patagonia.**

**83. Animal Cruelty-Free Products** — This company provides alternative shoppers with a convenient, one-stop shopping place for body, health, home, and pet care products, all animal cruelty-free. Free catalog. **Everybody Ltd.**

**86. Environmentally Progressive & Cruelty Free** — This firm offers the consumer a wide range of household and personal products which are non-toxic, biodegradable, recycled non-animal tested, and safe. Free catalog. **Eco-Choice.**

**90. Cook With The Sun** — SolarChef™ solar ovens cook, bake, boil, and brown all foods with natural sunlight. Complete information/order booklet about the SolarChef and accessories, \$2.25. **Synchronos Design, Inc.**

**95. Environmental Shopping** — 5 EcoSac™ reusable shopping bags, which are made of natural fibers, help to reduce paper and plastic in our landfills and help to save our environment. Free brochure. **Blue Rhubarb, Inc.**

**96. Reusable Menstrual Cup** — Safe, small, reusable, internally worn, pliable rubber menstrual cup. Simple to use. It's comfortable, economical and has a life expectancy of at least 10 years. FDA accepted. Satisfaction guaranteed for 3 months or money refunded. Free literature. **The Keeper.**

**97. Earth Friendly Products** — Paints, cleaners, enamels, carpet guard, stains, sealers, mildew control, shampoo, wax, and much more. All products are formulated for the chemically sensitive and the environmentally aware. Catalog, \$1.90. **AFM Enterprises.**

**99. The Drink Maker & Flavorit** — Eliminate plastic bottle waste. Make soda at home. Each refillable CO2 bottle makes 200 10oz. drinks. Add a squirt of flavorit Natural Fruit Concentrate for flavor. Brochure, \$1.25. **Globus Mercatus, Inc.**

**100. Paints, Wood Preservatives & Stains** — This firm has many ecologically safe products are available. Dealers inquiries are welcome. Free catalog. **Livos Plant Chemistry.**

**102. Newspaper Container** — Made from recycled cardboard, a unique and convenient storage container for newspapers in which they are suspended for ease in bundling. Custom printing available. Free brochure. **Paperboy Products.**

**107. Natural Cosmetics** — A pioneer of natural beauty care products since 1928. No animal testing on any of the products. The "Source of Natural Beauty" catalog features 24 pages of the finest natural beauty treatments and cosmetics available. \$1.25. **Orjene Natural Cosmetics.**

**109. Ecologically Sound Underwear?** — No, but this catalog offers hundreds of resource-saving and environmentally friendly products. Catalog, \$2.25. **Co-Op America.**

**119. String Bags** — 100% cotton string shopping bags. Reusable for hundreds of shopping trips and many other carrying needs. Available in different sizes, colors, and styles. Wholesale inquiries, include company name. Free literature. **Eco-Bags.**

**122. Safely Eliminate Odors** — NonScents, a natural volcanic mineral comprised of hydrated alumina silicate. No chemicals, treatment, or perfumes are added. Use for pet odors, smoke, refrigerators, diaper pails, basements, etc. Brochure, 75¢. **Ernest Ohl Enterprises.**

**126. Earth-Saving Products** — Make an environmental difference without moving to a cave. Buy quality, hard-to-find, recycled, energy efficient, earth-saving products for home and office. Give a gift to the planet as well as to a friend. Catalog, \$2.25. **We Care.**

**130. Environmental Investing** — Develop income and invest in life-supportive products and services. Free information. **Pax World Fund.**

**131. Reduce Home Energy** — Solar battery chargers, low flow showerheads, refrigerators, and more. Free catalog. **The Energy Store.**

**133. Environmental Game** — 800 intriguing questions, entertains while you learn about the environment. Great for families, schools, and clubs. Samples and ideas, \$1.00. **Earthword.**

**136. Recycling Containers** — Innovative commercial and residential recycling containers. Attractive, easy to use, and affordable. For offices, homes, hotels, schools, and convention centers. Free brochure. **Paper Plus Recycling.**

**137. Friendly Products** — Products for the chemically sensitive and environmentally aware. Free catalog. **N.E.E.D.S.**

**140. Office Recycling Program** — Desktop and intermediate containers in attractive designs. Some items available for immediate delivery. Free literature. **Action Packaging Systems.**

**142. Water-Saving Device** — This patented water conservation device reduces the waste water flow in toilets by 3 to 5 gallons per flush. It is installed in just seconds without tools. Free literature package. **The Mini Flush Company.**

**148. Solar Information** — Solar electricity for homes, RV's, water pumping, lighting, and more. Free literature. **Photocomm, Inc.**

**150. Packaging Products** — Urban Forest Packaging Products, a distributor of recycled paper and packaging products made from 100% recycled fiber. For wrapping, cushioning, fill. Easel and drawing paper pads also. Free price list. **Kieffer Paper Mills.**

# IS THERE ENOUGH GARBAGE IN YOUR LIFE?

(IF NOT, THIS PAGE IS FOR YOU!)

## CHARTER SET

When visitors to your library spot this handsome **GARBAGE** CHARTER SET on your desk, your reputation as the neighborhood intellectual is guaranteed. The CHARTER SET includes the first six issues, from Sept/Oct 1989 through July/Aug 1990, housed in a sturdy, permanent case. The case is covered in black leatherette and features our logo stamped in silver on the spine. It's the only way to get our sold-out first issue.

☐ \$39.95 #G204



## BACK ISSUES

**\$6.95 #G8906**  
**Nov/Dec 1989**  
Energy Efficient Cars  
Global Warming Basics  
Home Energy  
Buyers Guide to Organic  
Foods  
Garbage to Compost

**\$6.95 #G9001**  
**Jan/Feb 1990**  
Toilets. Low Flush/No Flush  
Diaper Hype  
Greywater: Why Throw It  
Away?  
Bottled Water Fads and Facts

**\$6.95 #G9002**  
**March/Apr 1990**  
Climate, Ecology  
Plants for Healthier Homes  
Minimizing Household  
Hazardous Waste  
Pest Control Without  
Chemicals

**\$6.95 #G9003**  
**May/June 1990**  
The Packaging Challenge  
Degradable Plastics  
Recycled Paper: Exploding  
the Myths  
Edible Landscaping

**\$6.95 #G9004**  
**July/Aug 1990**  
Natural Lawn Care  
Toward the Next Kitchen  
Municipal Composting  
Jogging Through the Smog

**\$4.95 #G9005**  
**Sept/Oct 1990**  
History of Garbage  
The Modern Landfill  
Environmental Investing  
Noxious Naturals

**\$4.95 #G9006**  
**Nov/Dec 1990**  
What's So Great About  
Seattle?  
Apartment Recycling  
The Urban Garden  
Markets For Recyclables  
Truth About Tampons

**\$4.95 #G9101**  
**Jan/Feb 1991**  
Whatever Happened To  
Solar?  
Recycling Plastics  
Myths of Tree Planting  
Truckin' Trash

**\$4.95 #G9102**  
**March/April 1990**  
Tracking the Big Drip  
Home Water Purifiers  
Recycling 101 Q&A  
Incineration  
Backyard Restoration



## SHIRTS

Make a "green" fashion statement in exciting **GARBAGE** shirts. You'll make your friends green, too — with envy. Three distinctive styles, each with our red-and-black logo on classic and classy 100% cotton.

## SEND MY ORDER TO

Name \_\_\_\_\_

Address (Orders shipped UPS: use street address only) \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Amount Enclosed (Canadian orders add \$6.00. U.S. funds only) \_\_\_\_\_

Telephone \_\_\_\_\_

Signature \_\_\_\_\_

Card # ☐ Mastercard ☐ Visa exp. date \_\_\_\_\_

	QUANTITY			PRICE	SUBTOTAL
	M	L	XL		
TANK				\$11.95	
TEE				\$13.95	
JERSEY				\$16.95	
N.Y. residents add sales tax for shirts →				TOTAL	\$

CALL IN YOUR CHARGE ORDER: 718-788-1700



This page is an addressed envelope! Just fill out the order form and the coupon above, enclose payment, detach page, and fold as indicated on the back.



TAPE  
HERE

TAPE  
HERE

FOLD HERE



PLACE  
STAMP  
HERE

TAPE  
HERE

TAPE  
HERE

# GARBAGE

THE PRACTICAL JOURNAL FOR THE ENVIRONMENT

435 Ninth Street  
Brooklyn, NY 11215-9937



FOLD HERE

## Make Clean, Quiet Electricity from Sunlight

A Great Power Source for Remote Homes, Boats, and RV's

Sunlight reaching the solar module is instantly converted to DC electricity. This charges storage batteries, which may power lights or appliances.



Send \$3.00 for an 88 page Catalog and Design Guide

## ALTERNATIVE ENERGY ENGINEERING

P.O. Box 339-GA • Redway, CA 95560  
(707) 923-2277

## Eco Bin

**Recycling Cabinet for the Kitchen**  
No more bags piled in corners or stuffed under the table. The ECO-BIN makes home recycling **neat, clean, and easy.** Made of cabinet grade birch veneer. Uses standard size paper grocery bags to collect glass, aluminum, plastic and junk paper with a shelf for newspaper underneath. 2,3 and 4 bag units available

For more information:  
**Sivalia Woodworks**  
201 Cumberland Ave  
Asheville, N.C. 28801  
(704) 258-8544

## Environmentally Sound Recycled Paper

Plain or Printed

Business Cards • Letterheads  
Flyers • Newsletters • & More

Small or large orders!  
Low Prices!

Print Power Services  
1-800-735-8260



ARE YOU HELPING MOTHER EARTH? WE ARE!

Let's Recycle with  
"THE GROCERY BAG"

Perfect For:

- ☐ Shopping
- ☐ Picnics
- ☐ The Beach
- ☐ Ball Games
- ☐ The Gym
- ☐ School

To Order Send:  
**\$6.00 FOR LARGE**  
(\$15.00 FOR 3) (7x11x16)  
**\$7.50 FOR JUMBO**  
(\$20.00 FOR 3) (7x17x16)  
Plus \$2.50 for Shpg & Handlg To.

J & J ASSOCIATES  
417-B E. Foothill Blvd., Suite 392  
Glendora, CA 91740  
For More Information Call  
818-335-2359 or 800-388-2359



## 100% COTTON SHOWER CURTAIN

Don't "dump" another plastic shower curtain! Tightly woven 100% cotton duck gets wet, but water stays in the tub. No liner necessary. Machine washable! No more grimy, sticky vinyl. White and Natural, \$30 + \$3.25 shipping. NYS residents add tax. Send check or money order to:



**NOPE** (Non-Polluting Enterprises)

P.O. Box 333G, Smethport, PA 16749

1-800-782-NOPE VISA/MC

## Beautiful Skin Healthy Environment

Natural, Biodegradable, Cruelty Free  
Body Care Products

Lotions Shower Gels Massage Oil  
Essential Oils Facial Scrubs Soaps  
Bubble Baths Conditioners Shampoos

(And Many Other Personal Care Products)

We Specialize in Custom Scenting!

(As Seen in Country Living Magazine)

"Country Rain Moisturizer"  
Turns dry, baked-out skin into soft,  
youthful complexion!  
Clean Fresh Fragrance

8 oz. — \$10.95 16 oz. — \$19.95

**The Cottage Body Shoppe**  
351 River St., Bigfork, MT 59911

1-800-874-0327  
Catalog \$1.00

VISA/MC & AMERICAN EXPRESS

## Wasting Away

AN EXPLORATION  
OF WASTE: WHAT IT  
IS, HOW IT HAPPENS,  
WHY WE FEAR IT, HOW TO  
DO IT WELL

Kevin Lynch

WITH CONTRIBUTIONS BY EDITOR  
Michael Southworth

At your bookstore or direct from:  
SIERRA CLUB STORE, 730 Polk Street, San Francisco,  
CA 94109. Please enclose \$25.00 plus \$3.00 shipping and  
handling. CA residents please add applicable  
sales tax. Phone orders (VISA/MC): (415) 923-5500.

SIERRA CLUB BOOKS



**151. Electrical Independence** — Energy-saving products including solar-electric, super-efficient lighting, tankless water heaters, solar pumping, composting toilets, and more. 105-page guidebook and catalog, \$5.25. **Integral Energy Systems.**

**152. Reusable Canvas Bags** — The environmentally sound alternative to paper and plastic bags. Quality construction, made in the USA from natural 100% cotton canvas. Free information. **Canvasack.**

**153. Food Waste Digester** — Made with recycled plastic. Uses solar energy and natural micro-organisms to dispose of food waste. One unit per four people. Works in all temperatures. Free literature. **Green Cone Distributors.**

**154. Healthful Products** — Custom scented hair care, skin care, bath, and massage products. Brochure, \$1.25. **The Cottage Body Shoppe.**

**157. Improve Your Image** — Find out how good printing on recycled paper with post consumer fiber can be for you. Free newsletter. **Alonzo Printing.**

**158. Re-Usable Oil Filter** — Washable oil and gasoline filters for both general consumers and severe duty vehicle fleets. Keeps toxic disposable automobile oil filters out of landfills. Catalog, \$1.25. **System 1 Filtration.**

**160. SmartSac™** — Recyclable, woven coated polypropylene shopping and recycling bags are smarter than canvas or strung. Strong, lightweight, moisture proof, FDA accepted material. Free brochure. **Personal Statements.**

**162. Responsible Packing** — Manufacturer of Quadra-Pak® and Sizzle-Pak® which are environmentally responsible packing and decorative accessory products. Free literature. **EcoPack Industries, Inc.**

**163. Partical Remover** — Now you can remove up to 96% of the irritating particals in your household air with this electrostatic filter for your air conditioning system or forced air furnace. Free literature. **Air Magnet.**

**164. Soilsaver Composter** — The Soilsaver composter can turn your household waste into a steady supply of rich, dark humus. It is attractive, easy to use, and is highly efficient. Free folder available. **Barclay Recycling Systems.**

**166. Recycled Packaging** — This company offers a wide variety of industrial as well as consumer packaging which is manufactured from recycled materials. A free environmental guide is available. **Sonoco Products Company.**

**167. Plastics Recycling** — The nation's largest recycler of post-consumer plastics producing polyester, nylon staple fibres and plastic resins from its recycling operations. Designers, builders, and operators of advanced materials recycling facilities. Free literature. **Wellman, Inc.**

**168. Paper & Printing** — This firm supplies 100% post-consumer fine paper, and they can meet your printing needs as well. Vegetable inks available. Servicing the east coast. Information and samples, 75¢. **Lynbar Enterprises.**

**169. Reusable Shopping Bags** — Manufacturers and distributors of quality reusable bags (canvas, nylon, mesh). Free brochure. **Earth Products.**

**170. Conscious Bank Checks** — Carry the messages of Greenpeace, NOW, Audubon, MADD, PETA and other organizations. Accepted in all U.S. financial institutions. Samples, \$1.25. **Message/Check.**

**171. Printer Ribbon Reloading** — Remanufacturing of most computer printer ribbons. Brochure, \$1.75. **The Ribbon Factory.**

**172. The Can-Factor** — A smashing idea for office, home, cafeteria, or wherever cans collect. Will crunch and store up to 250 aluminum cans before it needs emptying. Free brochure. **CSL & Associates.**

**173. Office Products** — Quality environmentally friendly office products at discounted prices. Fast shipping. Free catalog. **Boyd's Office Products.**

**174. Stop Junk Mail** — This service gets your name off mail marketing lists, and keeps it off others. Comprehensive kit, \$5.25. **Stop Junk Mail.**

**175. Pocket Tote Bag** — NeoSac®, sturdy nylon bags, 13.5"x12"x7", reduces to convenient 4"x4.5" when not in use. Made in USA. Assorted colors. Literature, \$1.00. **The Markuson Group.**

**176. Rubber Mats** — Weight lifting mats and tire link doormats made from recycled tires. Offered in many sizes. Other environmentally sound products also available. Free catalog. **Earth "N" Us.**

**177. Drip Irrigation** — Permits permanent deep burial below the tillage level of the garden or landscaping avoiding pinching off tubing by soil compaction. Free information. **Irrigro.**

**178. Rock Magazine** — Featuring the #1 Grateful Dead-Bay Rock publication as well as collectibles. Free catalog. **Relix Magazine, Inc.**

**179. Earth-Healthy Alternatives** — 100% cotton shower curtain, shampoo in a bar, all-natural deodorant stone, cellulose sponges, cotton string bags, and more. Catalog, \$1.25. **N.O.P.E.**

**180. Recycled Waste Containers** — A unique line of fire-safe steel waste receptacle containers. Recycling made easy with our space-saving units. Free recycle brochure. **United Marketing, Inc.**

**181. Environmental Books** — 50 Simple Things You Can Do To Save The Earth, The Recycler's Handbook, and many others. Free catalog available. **Earth Works Press.**

**182. Magnetizer Fuel Energizer** — Harness the power of magnets to effect fuel on a molecular level creating a more efficient burn and saving up to 25%. Brochure, \$1.25. **Native Enterprises.**

**183. Natural Way To Recycle** — The Kich n Komposter™ allows the home gardener to process food waste and create a nourishing organic fertilizer in one step. Free literature. **Carbco Industries, Inc.**

**184. Soap-Based Cleansers** — Clean your clothes and household without synthetic detergents. Free information. **Integra Trading Company.**

**185. Cruelty-Free** — Skin and hair care products which are naturally based and not tested on animals. Free catalog. **The Body Shop.**

**186. Chemical-Free Foods** — More than 500 whole, chemical-free foods. Vegetables, fruits, grains, juices, peanut butters, and more. Free catalog available. **Walnut Acres.**

## LITERATURE REQUEST FORM

Circle the numbers of the items you want. We'll forward your request to the appropriate companies. They will mail the literature directly to you...which should arrive 30 to 60 days from receipt of your request. Price of literature, if any, follows the number. Your check, including the \$2 processing fee, should be made out to **GARBAGE.**

4. \$3.25	63. Free	99. \$1.25	137. Free	162. Free	175. \$1.00
5. Free	65. Free	100. Free	140. Free	163. Free	176. Free
6. 75¢	66. \$1.25	102. Free	142. Free	164. Free	177. Free
10. Free	73. Free	107. \$1.25	148. Free	166. Free	178. Free
14. Free	76. Free	109. \$2.25	150. Free	167. Free	179. \$1.25
22. Free	81. Free	119. Free	151. \$5.25	168. 75¢	180. Free
34. Free	83. Free	122. 75¢	152. Free	169. Free	181. Free
36. \$4.20	86. Free	126. \$2.25	153. Free	170. \$1.25	182. \$1.25
41. \$1.75	90. \$2.25	130. Free	154. \$1.25	171. \$1.75	183. Free
44. Free	95. Free	131. Free	157. Free	172. Free	184. Free
53. Free	96. Free	133. \$1.00	158. \$1.25	173. Free	185. Free
57. Free	97. \$1.90	136. Free	160. Free	174. \$5.25	186. Free

Total \$\_\_\_\_\_ Plus Postage & Handling of **\$2.00** = Total Enclosed: \$\_\_\_\_\_

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ St. \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

Mail to: **GARBAGE** Reader Service, 123 Main Street, Gloucester, MA 01930

This card must be mailed before September 30, 1991.

9106

## You can unplug your dryer!



Our classic rack holds a full load of laundry and will last for years.  
\$58 plus \$9 ship. & hand.

We offer a variety of handsome well crafted racks using thick 5/8" dowels.

These racks will last! • 5 year guarantee  
SASE for brochure • VISA & MC accepted



**FUNNYBONE**

Rt. 1 Box 266K  
Charles Town, West Virginia 25414  
(304) 728-0173

## PRODUCTS FOR A SAFER, CLEANER WORLD

FREE 48 Page Catalog

- Recycled Paper Products • Water Filters
- Energy Efficient Lighting • Health Products
- Non-Toxic Paints • Air Purification Systems
- Biodegradable Home & Garden Products
- Water Conservation Kits • Books
- Much More!

**Eco SOURCE™**

P.O. Box 1666  
Sebastopol CA. 95473  
1-800-274-7040



## The ReBag Multi-Purpose Reusable Bag

- Durable waterproofed packcloth
- Sturdy wood handles
- Red • Blue • Purple
- Black
- Lightweight • Rolls up for storage
- Holds 2-3 grocery bags
- Up to 100 lbs. • Wipes Clean

Order from CHERRY TREE  
1-800-869-7742 \$15 Postage Paid

## Call for FREE Sample

Promote your  
recycling programs with  
imprinted items made of

**100% RECYCLED  
MATERIALS**

**SIGNATURE MARKETING**

An Environmental Promotion Company  
134 West Street, Simsbury CT 06070  
Telephone: 203.658.7172  
Fax: 203.651.8376

## EARTHWORMS...

### The Ultimate Garbage Recycler!

Help us convert waste into organic fertilizer. Earn substantial income in your backyard or land raising Earthworms under contract. We have also developed Commercial systems for Towns, Cities, and Municipalities for any size population. We're helping to make waste a thing of the past. For further information and brochure call or write:

**Concept Environment Incorporated**  
12005 Highwater Rd., Granada Hills, CA 91344  
(818) 831-5501

## We Take The Hassle Out Of Recycling



Dealer Inquiry Invited  
Factory Reps Needed  
Satisfaction Guaranteed



- Separates Glass - Paper - Cans
- Uses 30 gal. Bags or Larger
- Easy to Assemble
- Made of 18GA Steel - Painted
- Size 40L - 24H - 12D
- Made in U.S.A.
- Use in Kitchen - Pantry - Garage - Office

**\$49<sup>95</sup>**

To order, send check or MO to:

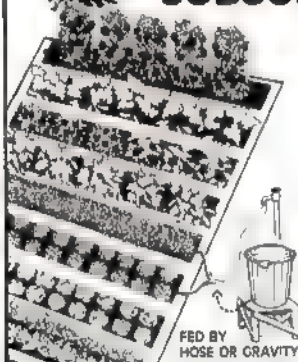
**ECHO HILLS CO.**

9500 Bauer Road • Logan, OH 43138  
(614) 385-8760



"We Have Only One Earth. Let's Keep It Green"

## NEW PERMANENT IRRIGRO SUBSURFACE



Continuous Drip Irrigation for Vegetable and Landscape Gardening. Waters entire garden for only Pennies per Square Foot!  
NEW COLLAPSE-RESISTANT MICRO-POROUS DRIP TUBING FEATURES:  
- DEEP BURIAL below tillage level avoiding annual removal  
- FLEXIBLE CURVES are permitted without kinking or clogging  
- SUPERIOR RESISTANCE TO DAMAGE from tools or insects by double wall thickness  
- EASILY INSTALLED PRE-ASSEMBLED SYSTEMS or order components for customized system for individual layouts  
- SAVE WATER AND COST, ACHIEVING MAXIMUM YIELDS AND QUALITY.  
"IRRIGRO" Systems range from the 200 sq. ft. complete Starter T-Kit (\$19.95), the 2,000 sq. ft. Master Gardener System (\$99.95) to the 10,000 sq. ft. Commercial Grower Rolls (\$300.00)  
Add 25% for the new SUBSURFACE collapse-resistant, double thickness tubing for superior durability and longevity

ORDER NOW or write for FREE ADDITIONAL INFORMATION TO:  
IRRIGRO, 1555 Third Ave., Niagara Falls, N.Y. 14304

Telephone (416) 688-4090  
Visa or Mastercard accepted or we ship collect.

## Safe Home

D i g e s t

- healthier building products
- healthier interior design
- latest on indoor air quality
- safe children's products
- health and nutrition

Send \$27.96 for 12 issues plus directory. Visa, MasterCard accepted. Provide card name and number, expiration date and signature.

Back issues available \$3.50.

Lloyd Publishing, Inc. 24 East Ave.  
Ste. 1300, New Canaan CT 06840  
(203) 966-2099

## NATURAL BODYCARE ECO-PACKAGING



Our premium-quality European body care products are cruelty-free and contain no synthetic preservatives. We package with the Environment in mind by using recycled glass and paper, and recyclable aluminum.

FOR FREE CATALOG  
CALL 1-800-648-6654



Box 8398 • Atlanta, Georgia 30306



### **SOLID WASTE DISTRICT MANAGER**

The Martha's Vineyard Refuse Disposal and Resource Recovery District on the island of Martha's Vineyard off the south coast of Massachusetts is seeking an experienced administrator to plan, coordinate and supervise all activities and functions of the District. Our program is in the middle stages of development, so candidates need to demonstrate creative approaches to waste management as well as administrative skills. The District currently handles 15,000 tons of waste per year, with considerable seasonal fluctuation. Current annual budget is \$2.2 million. Responsibilities will include: Planning for and construction of a central transfer station and recycling center; managing a program that recycles, landfills, and transports off-island for incineration; supervising 4 employees directly and 16 indirectly; developing budgets and managing District finances; coordination of District activities with 6 island towns as well as local and state regulatory agencies; implementation of innovative solid waste disposal methods. Requirements include a degree in a field related to waste management and at least 5 years of experience in waste management. Salary will be commensurate with qualifications. To apply, send full resume with references and salary history to: MVRDRD, PO Box 2106, Vineyard Haven MA 02568, Attn: Kent Healy, Chairman. The deadline for application is May 6, 1991.

### **COMPACT FLUORESCENT LIGHT BULBS**

Use 75% less electricity than standard incandescent bulbs, last up to 10,000 hours, screw into regular fixtures. Free string bag with first purchase. Limited time offer. For free brochure contact: Green Goods Inc., PO Box 116, Topsham ME 04086, (207) 721-0373.

### **DRIP IRRIGATION**

Make every drop count! Agricultural quality drip irrigation products available from California's do-it-yourself drip specialist. Broadleaf P4 polymer at bulk prices. Send \$1.00 for manual/catalog to: The Urban Farmer Store, 2833 Vicente Street, San Francisco CA 94116-2721

### **CARE ENOUGH TO SAVE THE VERY BEST?**

Small Potatoes Press presents greeting cards for all occasions, designed with wit and whimsy and printed on recycled paper. For samples and illustrated brochure, send \$1 to: PO Box 274, Hales Corners WI 53130.

### **ENVIRO EXPO**

An Environmental/Industrial Trade Show and Conference. May 21 and 22, 1991 at the Great Hall of the Bellemont Hotel in Baton Rouge, Louisiana. For further details, call (800) 467-3141

### **CONCERNED SINGLES NEWSLETTER**

Linking compatible, socially conscious singles who care about ecology, the environment, and peace. National and international membership. All ages welcome. Since 1984. Free sample: Box 555-G, Stockbridge MA 01262.

### **2ND ANNUAL MARCH FOR PARKS**

On May 4-5, 1991, thousands of Americans will show their support and raise much-needed funds for America's national parks. Designed to increase public awareness of problems facing America's national, state, and local parks. For more information, contact: National Parks & Conservation Association, 1015 Thirty-First St. NW, Washington DC 20007-4406, (202) 944-8530.

### **TREMENDOUS DEMAND FOR PURE WATER**

You can earn substantial income while helping others. Multi-pure's Solid Carbon Filtration guarantees highest quality system since 1970. Validated by extensive independent laboratory tests. Removes all 106 Priority Pollutants. 10-year warranty. 30-day trial. Free information packet on distributorship and/or filter. Training and support provided. Call today! Dennis Holmes (800) 735-6542.

### **ARE YOU RAISING AN EARTH FRIENDLY CHILD?**

Find out how your child can lead a happy, healthy life in the 21st century. Write for free details: Raven Press, 1900 Raven Drive, Suite 103, Fairbanks AK 99709-8358.

### **BED & BREAKFAST IN MIDTOWN NYC**

Environmentally sensitive arts professional offers B&B in Manhattan's Theater District. Walk to theaters, galleries, park. Beautiful renovated loft building. Private room and bath in apartment with air, water filters, humidifiers and two cats. Call (212) 307-5446.

### **BEAUTIFUL MAINE SAILING ADVENTURES**

For health-minded people. Relaxed shipboard lifestyle, hands-on sailing fun, gourmet vegetarian cuisine (some seafood for those who desire). '91 specialties: sailing and seamanship, natural history, men's, yoga, photography. Free brochure. For more information, contact: Figaro Cruises, PO Box 1336, Camden ME 04843, (800) 473-6169

### **USE NATURE'S WAY OF CLEANING INDOOR AIR**

A major portion of a person's exposure to pollutants is indoors. What to do? Build your own clean air machine. Grow flowers, vegetables, herbs indoors all yearround. Complete plans with illustrated instructions, \$12.95. Soilless Designs Inc., Dept. G, PO Box 768, Westmont IL 60559.

### **GREEN BUSINESS OPPORTUNITY**

Children's recycled educational coloring card line for sale. Wildlife cards featuring copy approved by the National Wildlife Federation. All designs include educational information. Looking for group/individual to build upon what we've established. Family demands limit further involvement. For catalog/info contact: Laurel Avenue Cards, PO Box 10752, Rochester NY 14610-0752, (716) 461-8336, 8:30a-5:00p EST.

### **GROW A FOREST**

Start an earth project in your home or apartment. 1000 tree seeds hand collected from the wild, dwindling forests of the Northwest. Instructions included. Fir or pine available. Send \$21.95 plus \$4 postage and handling to: Eco Seeds, PO Box 1117, Lebanon OR 97355.

### **ENVIRONMENT-CONSCIOUS COMMUNITY**

Stable rural area, clean air, pure water, low crime, little traffic, congenial neighbors, outdoor recreation, and low taxes. Own your land and/or home. Self-Reliant Life Seminars in summer. For further information, contact: Ponderosa Village, 195G Golden Pine, Goldendale WA 98620, (509) 773-3902.

### **ENVIRONMENTAL HEALTH NEWS**

The cutting edge bi-monthly newsletter that covers issues such as indoor air pollution, chemical sensitivities, alternatives to toxic products. One year subscription: \$15/individual, \$25/business, \$1 for sample copy. Send to: Organization for the Advancement of Environmental Health, 3865 E. Delhi Road, Ann Arbor MI 48103.

### **RELIGHT YOUR EXISTING FIXTURES WITH COMPACT FLUORESCENTS**

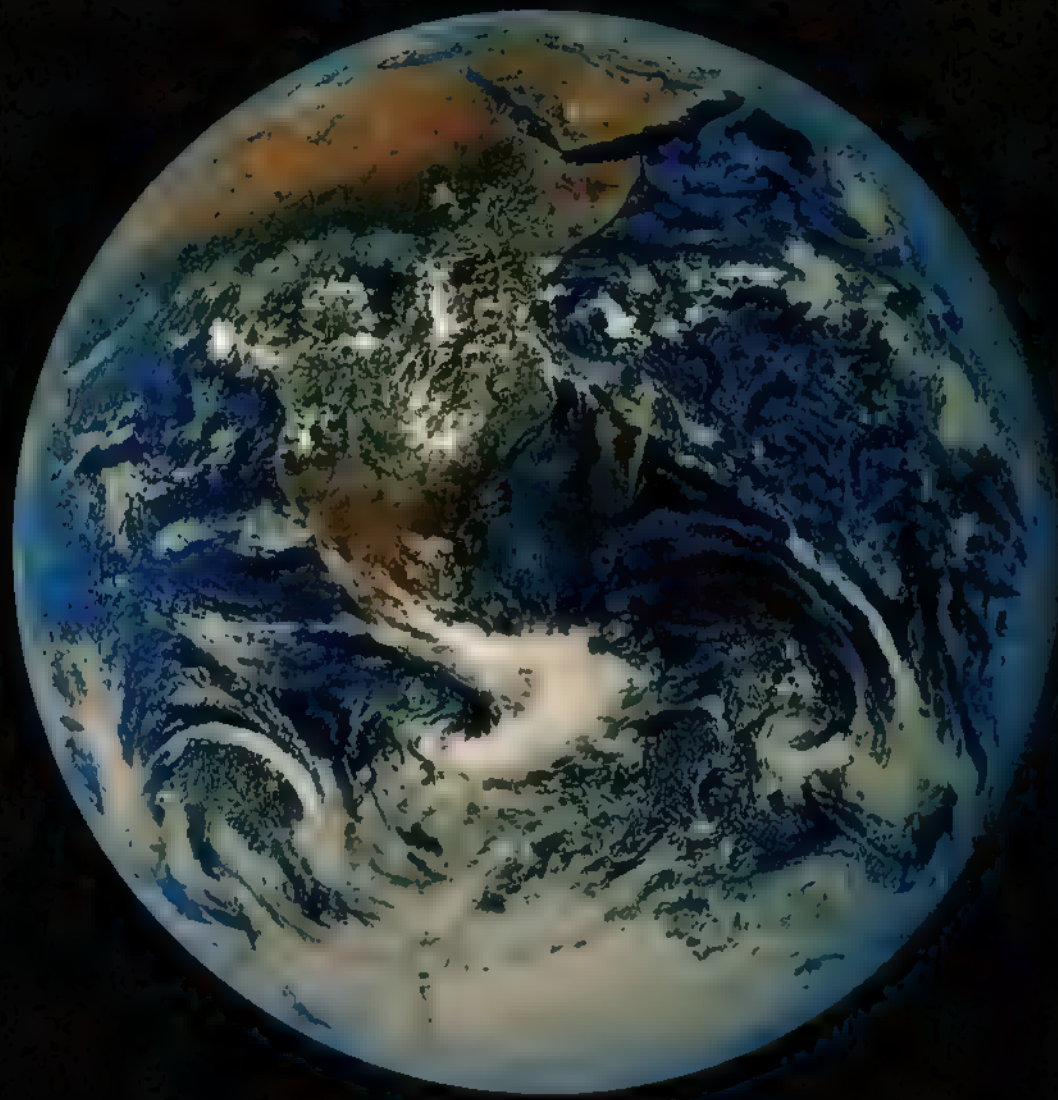
CF lights, light kits, fixture kits, fixtures and planning guide. Save 70% energy with 7-year lamps. Send \$3 (refundable) to: Lite Energy, PO Box 781A, Excelsior MN 55331

### **PLANT A TREE, HUG AN ENDANGERED ANIMAL**

Our unusual catalog (\$1) features environmentally responsible products and thoughtful gifts licensed by World Wildlife Fund, Rainforest Action Project, Cultural Survival, NRDC, and others. Blue Planet Products, Box 213-G, Boston MA 02123.

### **IS THE EXXON VALDEZ DOCKING IN YOUR LIVING ROOM?**

The Conscious Consumer newsletter helps you avoid environmental poisons that you may be using in your home or business. We critically evaluate green products, marketing and investments. Free publications/speakers list available for consumers and businesses. PO Box 51, Wauconda IL 60084, (708) 526-0522 (24 hours)



# IF YOU'RE NOT RECYCLING YOU'RE THROWING IT ALL AWAY.

A little reminder from the Environmental Defense Fund that if you're not recycling, you're throwing away a lot more than just your trash.

You and your community can recycle. Please write the

Environmental Defense Fund at: EDF-Recycling, 257 Park Avenue South, New York, NY 10010, for a free brochure that will tell you virtually everything you need to know about recycling.





## INTRODUCTION TO INDOOR POLLUTION

Workshop designed to bring professionals up-to-date concerning indoor pollution. San Francisco, May 4. Santa Monica, May 18. San Diego, May 19. Call: (415) 549-9693, (619) 436-5990, or (408) 372-8626.

## MODEL COMMUNITY DIRECTOR

Organize Midwest citizens to implement Model Community waste reduction program (see GARBAGE 5/90). College degree plus experience in grassroots organizing. \$19,000-\$21,000. Send application and resume to: Central States Education Center, 809 S. Fifth St., Champaign IL 61820.

## HOUSEHOLD HAZARDOUS WASTE

170-pg workbook highlighting HHW programs in the US with contact names in 17 states, I.D. wheels, and "Take Me Shopping" book included. Must for municipal planners/environmentalists. Send \$29.95 to: NSEC, PO Box 184, Highland Park IL 60035.

## ENVIRONMENTAL WORKSHOP

June 8, Keene NH. Respond and deal with large projects effecting local communities. E.D. Falcon, Antioch New England Graduate Sch., Roxbury St., Keene NH 03431, (603) 357-3122.

## WANT TO MAKE A DIFFERENCE?

Order your copy of A Student Action Guide. How to do fundraising, get press coverage, run a meeting, motivate and include others, plan projects, etc. Send \$4.95 to: YES!, 706 Frederick Street, Santa Cruz CA 95062.

## ALLERGIES, ENVIRONMENTAL ILLNESSES, CHEMICAL SENSITIVITIES?

Aqua-Polish® one-micron (absolute!) water filter produces up to 3 gpm mineral pure drinking water. 5", 10" countertop, undersink, chrome faucets. Polypropylene colored housings. Removes organics, inorganics, Giardia cysts and bacteria, and chemicals w/o disintegrating. Money-back guarantee. Other products. Dealers welcome. Seagull IV water purifiers. All Pro Pure Products, 200 W. El Norte Pkwy., #208G, Escondido CA 92026.

## EARTH WORK

A new monthly magazine incorporating JobScan: environmental/natural resource jobs with federal agencies and conservation organizations from coast to coast. Career insights, job hunting advice, environmental "think" pieces, and interviews. \$6/Single, \$29.95/1 year. Earth Work, c/o Janet Warren, PO Box 550, Charlestown NH 03603.

## 100% COTTON MENSTRUAL PADS

Good for the Earth! Beltless, beautiful, washable, soft flannel. Sampler, \$13.95 (CA res. add 6.25% tax) +\$3.50 shipping. For brochure, send SASE to: New Cycle, PO Box 3248, Santa Rosa CA 95402.

## SAVE MONEY & THE EARTH WITH RE-USABLES

Cloth diapers, terry bibs, everyday cotton napkins, cheesecloth salad bags, cotton coffee filters, dish towels, denim bib aprons, cotton shower curtains, flannel sheets, and more. MC/Visa. Free catalog. Clothcrafters, RB1, Elkhart Lake WI 53020, (414) 876-2112.

## CLASSIFIEDS

Rates \$125 for the first 40 words, \$2 each additional word. Submissions must be in writing and prepaid. No commissions or discounts on classified advertising. Send to:

## GARBAGE

Attn: Classifieds  
123 Main Street  
Gloucester MA 01930

Small display ads are charged by the column-inch, contact our advertising sales office.

## Are you an ECOTIST?

Do you cringe when you think of rampant pollution? Do you feel endangered species are family? Some might call you downright ecological. But it's OK. We feed ecos like yours.

**RECYCLED PAPER**  
PEN Safe, refillable  
QTY — \$3.25 ea  
incl S&H  
**RECYCLED STICK'M**  
NOTEPAD  
3" x 4", 50 sheets. QTY — \$1.75 ea incl S&H  
**SAFE STYROFOAM?**  
Only when it's porcelain  
Ours is. Lead free, 10oz cap  
QTY — \$9.00 ea incl S&H

**NEW AGE SAUCER**  
Made of born-again plastic, 9 1/4" diameter. Cuts right through polluted haze! QTY — \$2.75 ea. incl S&H



**BUSY?** Invaluable book by Marjorie Lamb gives 235 easy steps to help save the planet—in only 120 seconds a day. 238 pgs. \*\*Publisher plants two trees for every one used to print the book. QTY — \$5.95 ea. incl S&H



Dept G3391  
2965 Pinewoods Rd, Lewiston ME 04240  
Tel. (207) 782-3756, Fax (207) 783-3742  
Check, MO, MC/VISA accepted.

5% FOR THE PLANET

## NEW KICH'N KOMPOSTER

## Turn Your Food Waste Into Fertilizer!

Measures only  
16 w x 14 1/2 h (adj) x 8 1/4 d



- Recycles organic waste back to nature
- Connects to any home food disposer
- Do it yourself easy installation
- Self-cleaning
- Operates on 115VAC (plug in or hard wire.)

Provides rich, organic compost for your plants and garden.

NAME (Please Print) \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ST \_\_\_\_\_ ZIP \_\_\_\_\_  
PHONE ( ) \_\_\_\_\_

- ☐ Please send more information  
☐ Please send me \_\_\_\_\_ Komposters @ \$129 each.

Please enclose check or money order payable to CarbCo Industries Inc. Add \$3.95 per Komposter for shipping and handling. HI and AK add \$20. Canada add \$10. New York residents add applicable sales tax. Allow 3 to 5 weeks for delivery.



MAIL TO:  
CarbCo Industries Inc.  
1111 Michigan Street  
Lockport, NY 14094  
716 434-0316



## Healthful, Delicious Organic Foods, Delivered to Your Door

Call Today for Your Free Walnut Acres® Catalog

Five hundred whole, chemical-free foods are as close as your telephone. Delicious whole grains, flours, seeds, beans, fruits, vegetables, juices and much more. From Walnut Acres Organic Farms, a tradition of farming without pesticides or chemicals of any kind for over 40 years.

For a free catalog, call toll free:  
**1-800-344-9025, ext. B122**  
Or send us the coupon below.

Your Purchase is 100% Guaranteed.

- ☐ Send me a FREE Walnut Acres Catalog

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State/Zip \_\_\_\_\_

**1-800-344-9025, ext. B122**  
Mail to: Walnut Acres, Dept. B122  
Penns Creek, Pa. 17862



## CONSERVE FUEL!

**Increase: Safety • Gas Mileage  
Tire Life • Reduce Emissions**  
Valve caps *constantly* monitor air pressure! Just screw on your tire valve stem.

**Tell at a Glance!**

RED shows air loss!

Set of 4 Tirecheck TM

valve caps, \$9.95 +

\$1.75 S&H chk/Mo

• VISA/MC call

(914) 232-0977

Pelican Corp.

PO Box 411

Katonah, NY 10536

Send for our FREE catalog

## SMOOTH & SOFTEN ROUGH SKIN

FOOTSCRUBBERS™ remove rough skin and callouses like nothing

you've ever

used before.

Hand-made

of natural

terra-cotta

with Earth-

Friendly

packaging.



\$9 INCLUDES SHIPPING

Foot Scrubber™

Box 24550 Omaha, Ne 68124

## CONSERVE WATER

SAVE MONEY With

## WATERBOSS

America's No. 1 Water and Energy Conserving Shower Head



\$8.99 each  
SPECIAL 2 for \$16  
\$1.25 shipping each  
check or money order

TO: MR. SHOWERHEAD

P.O. BOX 100866

SAN ANTONIO, TX 78201

For info call (512) 737-3481

Super High Pressure Spray on 2 gpm or less:  
The best shower, using the least water, PERIOD!

SATISFACTION GUARANTEED

## ECO-CHOICE

ENVIRONMENTALLY PROGRESSIVE  
& CRUELTY-FREE PRODUCTS

## FREE BROCHURE

1-800-535-6304

recycled paper products, biodegradable  
household cleaning products, biorational pest  
controls, recyclables containers, personal care,  
hair & skincare, cosmetics, washable diapers,  
baby products and much, much more

ECO-CHOICE, Dept. 208, P.O. BOX 381,  
MONTVALE, NJ 07645



Biotech  
Building  
Systems

environmentally conscious architecture

All building types designed according to your  
needs, incorporating: energy efficiency, site  
responsiveness, recycled materials, and less  
waste during construction.

161 Emerson Pl. # 4G Brooklyn NY 11205  
phone (212) 7771049 fax (718) 7894142

## Cloth Grocery Bags Your Logo Free!

No Minimum Order

**\$5.25 Each**



35.00 Screen Charge, One Time Only

• 100% Cotton Duck

• 9"x11"x16" High

• Handles Securely Sewn

• Machine Washable

• Folds Flat (like paper bags)

• Shipped in 10 Days

Environmentally Sensitive Products

1765 Indiana Ave, Atlanta, GA 30307 404/377-5113

## ADVERTISERS' INDEX

READER SERVICE #	PAGE #	READER SERVICE #	PAGE #	READER SERVICE #	PAGE #
140	Action Packaging Systems.....25	131	The Energy Store.....27	136	Paper Plus Recycling, Inc.....66
97	AFM Enterprises Inc.....70		The Environmental Bag Company.....70	102	Paperboy Products.....25
163	Air Magnet.....60		Environmental Defense Fund.....77		Parnassus Fund.....5
157	Alonzo Printing.....25	73	Environmental Resource Project.....22	81	Patagonia.....Inside Front Cover
4	Alternative Energy Engineering.....73		Environmentally Sensitive Products.....79	130	Pax World Fund.....22
66	Atlantic Recycled Paper Co.....23		Equinox Ltd.....22		Pelican Development Corp.....79
164	Barclay Recycling.....19	83	Everybody Ltd.....60		Penquin Books.....21
53	Berner Air Products, Inc.....13	8	E.L. Foust Company.....27	160	Personal Statements.....67
	Better World T-Shirts.....66		Funnybone.....75	148	Photocomm, Inc.....61
	Biotech Building Systems.....79	99	Gilden Tree, Inc.....79		Piedmont Products.....26
95	Blue Rhubarb, Inc.....25		Globus Mercatus.....69		Print Power Services.....73
173	Boyd's Office Products.....61	153	Green Cone Distributors.....60	34	Real Goods.....18
57	Brush Dance.....62		Hyacinth House Publishing.....66	178	Relix Magazine Inc.....69
152	Canvasack.....14	184	Integra Trading Company.....70	12	Resource Conservation Technology.....67
183	Carbo Industries Inc.....78	151	Integral Energy Systems.....70	171	The Ribbon Factory.....14
	Cherry Tree.....75	177	Irrigro.....75		Schaefer Applied Technology.....15
63	Children's Television Workshop.....27,69	10	Island Press.....9	14	Seventh Generation.....23
109	Co-Op America.....21		J & J Associates.....73		Sierra Club Books.....73
	Concept Environment Inc.....75		The Job Seeker.....14		Signature Marketing.....75
	Conservation Concepts.....7	96	The Keeper.....62	41	Signs & Symbols.....78
154	The Cottage Body Shoppe.....73	130	Kieffer Paper Mills, Inc.....26		Sivalia Woodworks.....73
	Coveside Conservation.....70		Laidlaw Environmental.....19	166	Sonoco Products Company.....13
168	Crestwood Paper - Lynbar Enterprises.....13	100	Livos Plant Chemistry.....61	174	Stop Junk Mail.....25
5	Cross Pointe.....4		Lloyd Publishing, Inc.....75	36	Suneico.....62
172	CSL & Associates.....60		Logona.....75	90	Synchronos Design Inc.....61
6	Diversified Recycling Systems.....9	175	Marketing Associates.....70	158	System One Filtration.....20
	Earth Kit.....70	170	The Markuson Group Inc.....69		Teamwork Productions.....10,68
176	Earth "N" Us.....22		Message/Check Corp.....2	76	TreeKeepers.....9
169	Earth Products.....19		MGB Press.....15	180	United Marketing Inc.....12
	Earth Rising Productions.....62	142	Mini Flush Company, Inc.....11	186	Walnut Acres.....78
181	Earth Works Press.....61	65	Robert Mitchell Associates.....60	126	We Care - Earth Sense Inc.....15
44	Earthwise.....62	137	Mr. Showerhead.....79	167	Wellman, Inc.....1
133	Earthworld, Inc.....67		N.E.E.D.S.....67		The Wilderness Society.....71
	Echo Hills Company.....75	179	N.O.P.E.....73	11	Windsor Barrel Works.....14
	Eco Source.....75	182	Native Enterprises.....23		Women's Choice.....70
119	Eco-Bags.....60		New Alternatives Fund, Inc.....27	22	Working Assets Funding Service.....Inside Back Cover
86	Eco-Choice.....79	122	Ernest Ohi Enterprises.....62		
162	EcoPack Industries, Inc.....15	107	Orjene Natural Cosmetics.....21		





# Gardening With Carburetors

**S**aturday in suburbia. With dawn comes the song of the bluebird — and the grinding of a garbage truck. Soon, all of nature's sounds are squelched by an angry, mechanical chorale: the baritone growl of Lawn Boy, the tenor whine of your neighbor's hedge trimmer, the soprano squeal of his weed-wacker. For this you escaped the noise of the city? And the smog?

Decibels aside, a lawn mower may pump out 50 times more pollution per horsepower than a typical truck engine. Their small, two-stroke engines, with their rudimentary carburetors and rich gas/oil mixtures, just aren't very good at cutting pollutants or conserving fuel.

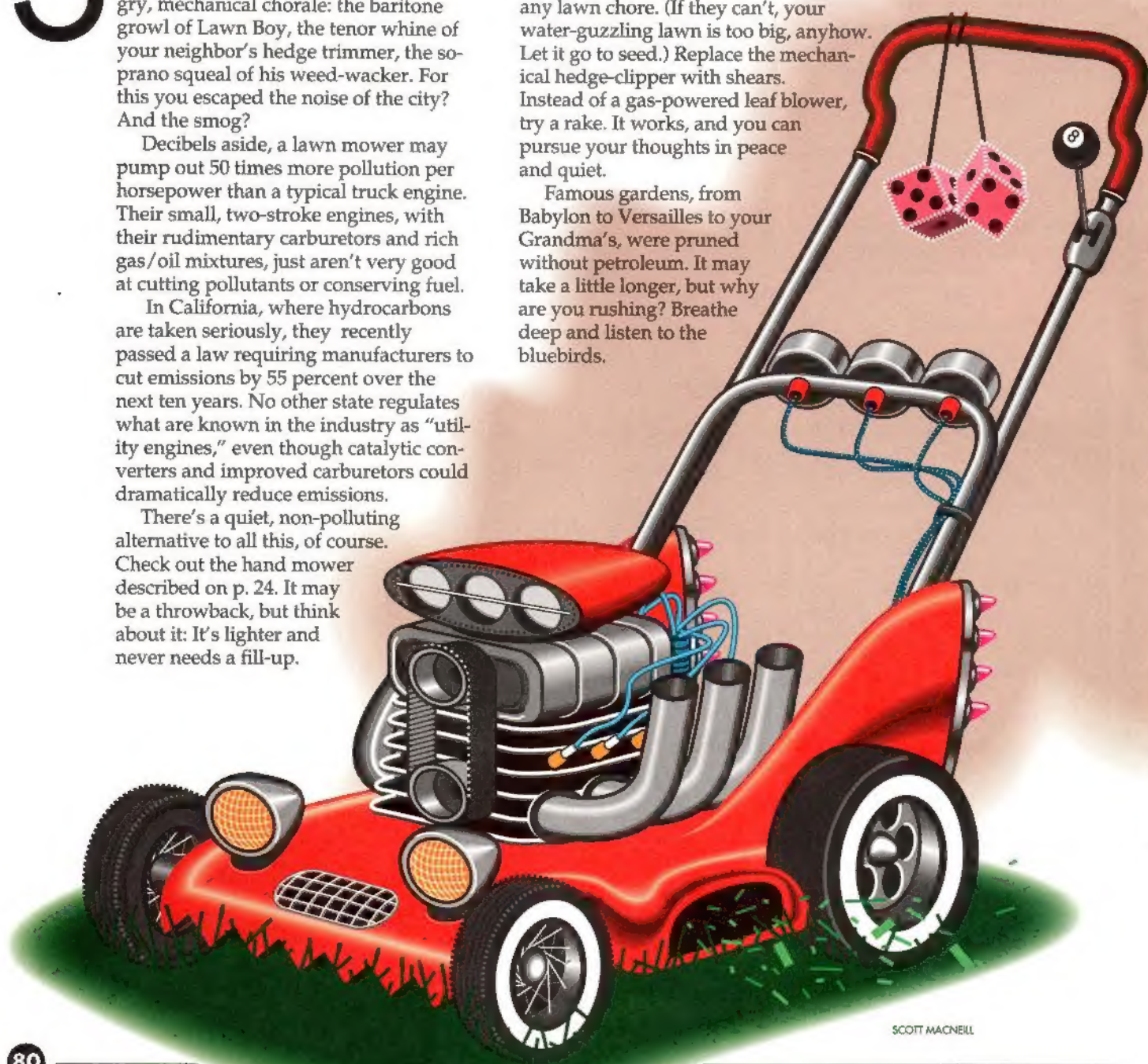
In California, where hydrocarbons are taken seriously, they recently passed a law requiring manufacturers to cut emissions by 55 percent over the next ten years. No other state regulates what are known in the industry as "utility engines," even though catalytic converters and improved carburetors could dramatically reduce emissions.

There's a quiet, non-polluting alternative to all this, of course. Check out the hand mower described on p. 24. It may be a throwback, but think about it: It's lighter and never needs a fill-up.

Push one around the yard for an hour and you've burned over 400 calories. Sounds like progress to us.

In fact, hand-powered tools can tackle any lawn chore. (If they can't, your water-guzzling lawn is too big, anyhow. Let it go to seed.) Replace the mechanical hedge-clipper with shears. Instead of a gas-powered leaf blower, try a rake. It works, and you can pursue your thoughts in peace and quiet.

Famous gardens, from Babylon to Versailles to your Grandma's, were pruned without petroleum. It may take a little longer, but why are you rushing? Breathe deep and listen to the bluebirds.



SCOTT MACNEILL





**Randy Hayes**, Executive Director, Rainforest Action Network

## “If you don’t like the way the world is, you change it...”

For people like Randy Hayes, changing the world is a lifetime commitment. That's why he founded an international action network to stop the destruction of tropical rainforests. Home to more than half our planet's plants and animals.

It's also why he carries a Working Assets Visa® Card, the world's first and most popular socially responsible credit card.

When you sign-up, we contribute \$2 to time-tested groups working for peace, human rights, and a safer environment,\* plus five cents more every time you use your card. All at no cost to you. Since 1986 we've donated over \$1 million.



But that's not all. If you qualify for the Working Assets Gold Card, offered through MBNA America,\* you'll get:

- No annual fee for the first year<sup>†</sup>
- Higher lines of credit
- Supplemental Rental car collision coverage
- 24-hour customer service
- Premium buyer's protection plan.

Help build a better world. Join Randy and over 100,000 concerned cardholders. Apply for a Working Assets Visa® Gold or Visa® Classic Card today.

**Apply Today!**  
**Call toll-free, anytime.**  
**1-800-847-7378, ext. 5000**

Be sure to use this priority code when calling: TESP

**WORKING ASSETS VISA®**

MBNA America® is a federally registered Service Mark of MBNA America Bank, N.A. Visa® is a federally registered Trademark of Visa U.S.A., Inc., used pursuant to license. <sup>†</sup>2nd year Annual Fee \$40.00 for the Visa Gold; \$20.00 for the Visa Classic.

\*For a complete list of groups funded in the past, write us at 230 California St., San Francisco, CA 94111





# Nevada's Other Watering Hole

**E**arly in this century, workers dammed Nevada's Carson River into narrow irrigation canals. The event was hailed as a coup for progress. The reason: Some 77,000 acres of desert bloomed with garlic, alfalfa, even melons.

**Workers clean an irrigation ditch (bottom), which delivers water to the Stillwater refuge.**

But there were losers. They were the thousands of migratory waterfowl — swans, great egrets, white-faced ibis, snow geese — that used to sail down and feed in the Stillwater National Wildlife Refuge, once laced with 80,000 acres of marshes fed by the river.

In the decades since the Carson was split up and sold, the refuge has only had legal rights to irrigation runoff flushed from farms. The runoff leaches from the dry earth a heavy load of natural toxins like arsenic, selenium, boron, and mercury. Summer evaporation leaves a concentrated brew that may have twice the salinity of seawater. In 1987 and '88, there were unexplained die-offs of fish and birds. By the summer of '89, just 4,000 acres of Stillwater were underwater.

But on Earth Day 1990, Stillwater got some refreshment. The Nature Conservancy, with other agencies, convinced a local farmer to sell Stillwater the rights to submerge 189 acres per year under a foot of water. The Conservancy's goal is to secure about \$50 million worth of water rights, enough to flood 25,000 acres.

As fresh water gurgles through the sluice gates into the refuge, it accomplishes something the birds won't ever notice: It dilutes and flushes away the toxins, making a safer food chain. What the birds on the flyway *will* notice is a growing oasis of greenery interspersed with gleaming mirrors. Seeing water, the travelers will again glide down from the sky in noisy thousands, to the rest area used by their ancestors for 12,000 years.

—Hannah Holmes



PHOTOS COURTESY USFWS

